

THE OHIO STATE UNIVERSITY

ABSTRACTS OF MASTERS' THESES

Number 4

Abstracts of Theses Presented by
Candidates for the Master's
Degree at the August
Convocation, 1930

THE GRADUATE SCHOOL



THE OHIO STATE UNIVERSITY PRESS

COLUMBUS

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1930



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FOREWORD

In accordance with University regulations, each candidate for the Master's degree must deposit in the office of the Graduate School not later than five days previous to the day on which he expects to receive his degree, an approved, typewritten copy of an abstract of his thesis, containing from 250 to 400 words. The abstracts presented at the close of each quarter are printed immediately after the close of the quarter, with the exception of the Autumn and Winter Quarters when the abstracts of both are published in one volume at the close of the Winter Quarter. This bulletin contains the abstracts of the theses presented by candidates for the Master's degree at the August Convocation, 1930.

These abstracts are printed primarily for the convenience of the members of the instructional staff of the University. It is recognized that theses submitted for the Master's degree are generally of the nature of essays and rarely contain any contributions to knowledge.

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AN INTRODUCTION TO A PHOTO-ELECTRIC STUDY OF VISION AT VARIOUS GENETIC STAGES

Edward Morgan Alkire, B.A.,
The Ohio State University, 1929

Department of Psychology

Recently several very significant fundamental studies of vision have been carried on by Messrs. Allen, Hecht, and Judd. The first of these has approached the problem of vision by application of the method known as the method of critical frequency. Dr. Hecht has studied the problem primarily as a way of applying some of the fundamental equations of chemical behavior to the action of the visual receptor. Dr. Judd's method is to a large extent the mathematical handling of the problem which may serve as a means for determining the strong and the weak points of the different theories of vision.

The present study is a fundamentally different approach to the whole problem. The aim of the present writer is to determine the magnitude and character and range of the photo-electric effect of excised eyes of animals occupying different positions in the genetic series. The apparatus involved consists chiefly of a delicate spectrometer, and a quadrant electrometer. Of course there are many other items of an accessory character.

The method employed is to excise an eye from any given form and use it as a source of electromotive force in a circuit of which the quadrant electrometer is one part. When the eye is inserted into the circuit, light of a definite known wave length is admitted into the eye, and in this way an electromotive force is generated and is indicated by the action of the quadrant electrometer. Wave lengths all the way along the visible spectrum are admitted into the eye, and the concomitant effect noted.

The complete study aims to be a record of such an effect secured from a variety of animals at different stages of the evolutionary process.

COMMUNITY CENTERS AS SCHOOL CENTERS
HARRISON COUNTY, OHIO

Harry Arnott Appler, B.Sc. in Edu.,
The Ohio State University, 1926

Department of School Administration

It is the purpose of this study to make a survey of the school facilities within the county; to determine the trade and social centers of the county; and to make some recommendations that will help provide a more equal educational opportunity for all children in the county.

The present condition of the schools was carefully studied by means of reports and other information obtained from the county offices. A school-district map was constructed showing that the lines of the twenty-four school districts largely followed the civil lines, such as township lines. In these twenty-four districts an excessive number (74) of one-room rural schools and eleven high schools was found. Further study revealed that the ability and effort made to support these schools varied widely. Much duplication of effort and inequality of educational opportunity was discovered. The only solution for the situation is to create larger units for taxation and administration. These may be obtained by centralization and super-centralization.

In order to determine the position of these centralized schools, a study was made to locate the community centers of the county, with the idea in mind that the school centers and community centers should coincide. This community study was made by the questionnaire method.

As a result of this study the following recommendations were made:

1. The 8-4 plan be replaced by the 6-6 plan.
2. The upper five grades at Tippecanoe be discontinued and the pupils be transported to Freeport and Uhrichsville.
3. The upper five grades at Moorefield be discontinued and the pupils be transported to Freeport and New Athens.

4. The upper five grades at Shortcreek be discontinued and the pupils be transported to Cadiz and New Athens.
5. The upper four grades at Germano be discontinued and the pupils be transported to Jewett and Hopedale.
6. The County Board of Education of Carroll and Harrison Counties, through the county superintendents, coöperate to eliminate the duplication of effort at Bowerston and Leesville.
7. A large number of specified rural schools be studied from the viewpoint of their elimination.
8. The county unit be adopted for this county.

INFRA-RED ABSORPTION SPECTRA OF CERTAIN ORGANIC COMPOUNDS

David William Armstrong, B.S.,
Mount Union College, 1927

and

Ralph Ernest Clarridge, B.E. Physics,
The Ohio State University, 1929

Department of Physics

Several investigators in recent years have worked on infra-red absorption spectra in an attempt to determine the relationship of the absorption spectra to chemical constitution. However, due to the large number of organic compounds, many yet remain which have not been studied in this region. The purpose of the present work is to furnish additional data on several available hydrocarbons, in the hope that it will be of some use in determining their molecular structures.

The equipment used was a large lamp with a linear filament, a specially designed spectrometer, a Coblentz linear thermopile, and a Leeds and Northrup high sensitivity gal-

vanometer. The radiation from the linear source was focused on the first slit of the spectrometer by a large, concave, face-silvered mirror. The radiation passing through the slit was then made parallel by a second concave mirror, also silvered on the front surface, and the parallel rays fell upon a rotary prism, which was silvered on its back surface. The radiation was reflected to the second mirror which in turn reflected it to a small, plane, face-silvered mirror near the first slit. This last mirror reflected the radiation to the second slit behind which was the linear thermopile. The galvanometer with a scale distance of three meters was connected directly to the thermopile.

By rotating the prism, which was mounted on an accurately divided circle, radiation of any particular wave length was focused on the second slit and the thermopile. Two matched cells, one empty and one filled with the substance to be studied, were so mounted that they could alternately be placed before the first slit. Two sets of cells were used, one of thickness 1.022 cm. and the other of 2.54 mm. thickness.

The percentage transmission was obtained by multiplying the ratio of the deflection of the galvanometer when the radiation passed through the full cell to that when the radiation passed through the empty cell by 100. In order to find the above deflections, the zero reading of the galvanometer was noted with the shutter closed; then the reading was observed with the radiation passing through the empty cell, and finally a second zero reading was taken with the shutter closed. The difference between the average of the two zero readings and the empty cell reading gave the deflection of the galvanometer due to the radiation passing through the empty cell. The deflection of the galvanometer due to the radiation passing through the full cell was found in a similar manner. Then the percentage transmission was calculated and a curve was plotted with angular displacement of the prism from the position at which the D line of sodium fell upon the thermopile slit as abscissa and the percentage transmission as ordinate. A wave length

scale in μ , taken from a calibration curve was then superimposed on the graph.

The following table gives the location of the minima in the percentage transmission curves, for the compounds studied.

Substance	Ethylene Glycol	Glycerol	Propylene Glycol	Trimethylene Glycol
a.			1.194 μ	1.190 μ
Band 1	1.202 μ	1.194 μ		
b.			1.199	1.195
Band 2	1.525	1.525	1.532	1.553
Band 3	1.703	1.700	1.682	1.701

THE HISTORY OF THE SANTA FE TRAIL

Arthur Dale Askins, B.Sc. in Edu.,
The Ohio State University, 1926

Department of History

Doubtless some form of trade existed between the Missouri Valley folk and the inhabitants of the valley of the Rio Grande before the coming of the Spaniards. The Coronado cavalcade was the first recorded expedition between the two valleys.

After the settlement of New Mexico, the Spaniards took little interest in the far interior for a long time. However, in the early part of the eighteenth century some French expeditions reached Santa Fe and returned to the Mississippi Valley, bringing back interesting information about the land to the far southwest.

Although a few American traders visited New Mexico before Pike returned from his famous expedition in 1807, it was he who, through his written accounts, interested the American people in this far-away land.

Trade was practically forbidden by the Spanish authori-

ties until Mexico gained her independence in 1821, but then it began in earnest and has increased to the present time.

The traders as a rule followed what was later known as the Santa Fe Trail, which extended between the great bend of the Missouri and the small siesta-loving Spanish town of Santa Fe. It followed the favorable contours of the plains, crossed rivers at convenient fords, and passed around or over the mountains at the lowest elevations. In time it became a much-travelled highway, carrying merchandise not only to and from Santa Fe, but also to the whole southwest.

The trail wound through the Great Plains country which was covered with vast herds of buffalo and other wild animals and infested with the warlike Pawnees, Cheyennes, Arapahoes, Comanches, Kiowas, and Apaches. These Indians gave a vast amount of trouble to the traders, who received very little aid from the United States government until the eve of the Civil War.

The trail served as a highway during the Mexican War. Kearny led his famous "foot-cavalry" over it on his way to New Mexico and California. During the Civil War the eastern end was used by guerrilla bands, while to the west soldiers of the Union passed over it in their search for the ever elusive Indian.

During the gold rushes to California and Colorado, gold seekers in vast numbers passed over the Santa Fe Trail hastening to the land of the El Dorado in the west.

Soon after the Civil War the railroads began "eating up" the old trail, each western terminal town of the railroad becoming the eastern terminal of the trail, until in 1880 the locomotive thundered into Santa Fe and the Santa Fe Trail was at an end.

Today the Trail is appropriately marked by monuments which were purchased by money contributed by the legislatures of the states through which it ran, the Daughters of the American Revolution, the school children of Kansas, and various county and local organizations.

PUBLIC OPINION IN GREAT BRITAIN CONCERNING THE SPANISH-AMERICAN WAR

Everett Augspurger, B.S. in Edu.,
Miami University, 1926

Department of History

This thesis is based upon editorials found in representative English newspapers and articles in leading British magazines during the period 1897-1899.

A study of the materials found in these sources shows that public opinion in Great Britain supported the United States at virtually every stage of the war:

1. The conditions existing on the island of Cuba were held to justify the intervention of the United States.

2. The superior American forces were certain to defeat Spain.

3. When the outcome of the war became evident, Spain was urged to make an immediate peace.

4. The United States was not to be deprived of any of the prizes that her victory had won for her—including the Philippines.

5. Any attempt of the countries on the continent of Europe to intervene on the side of Spain would be met by England's active support of America.

6. Throughout the period of the war, the prospect of an Anglo-American alliance was enthusiastically entertained in Great Britain, with all the support to the American cause that such an idea entailed.

The motives upon which this support was based were quite as worthy as those which prompted the United States to take part in the conflict. British public opinion was motivated by:

1. Humanitarian interest in the Cuban sufferers of Spanish misgovernment.

2. A feeling of racial kinship with the Americans that caused them to look upon the accomplishments of the United States as a reflection upon the prestige of Englishmen.

3. Commercial interests in China and the Far East which would have been seriously jeopardized had any country but the United States secured jurisdiction over the Philippines.

4. The need of England for an ally. By 1898 that country had definitely determined to abandon her policy of "splendid isolation," and the United States, because of its race and language as well as its immense common interests with Great Britain, was the one country most favorable to British diplomacy.

The significance of this support of the American cause throughout the war lies in the fact that it is one of the factors in establishing a rapprochement between the two nations of the Anglo-Saxon race and in bringing about a changed attitude in this country toward England. The two countries that had opposed each other throughout the nineteenth century were to coöperate in the opening years of the twentieth.

WHEELING, WEST VIRGINIA, DURING THE CIVIL WAR

Henry Hewetson Ault, B.A.,
Muskingum College, 1925

Department of History

Wheeling was the largest city in western Virginia in 1860 and naturally became the leader in the movements of that region since she was the only city with an assured Union majority. Camp Carlisle was situated there, and the city was the seat of both the "reorganized" and the new state governments. Her interests in trade and manufacturing being Northern, she cast her lot with that section. After the break with eastern Virginia, a large portion of the

people lost their interest in political affairs until a reaction set in against the Union policies in 1864, and a minority refrained from voting because they were not allowed full freedom of speech.

The Baltimore and Ohio Railroad and the Ohio River were Wheeling's most important methods of transportation. The former suffered from rebel raids, and the latter from low water, especially in 1860 and 1861. Because of the large volume of government freight, a traffic congestion resulted. Trade restrictions, due to nearness to the South, further handicapped business, and industry suffered from a severe depression until a decided change took place in the fall of 1862. Government contracts were the foundation upon which this recovery was built.

The fall of 1862 marked other changes. Lawlessness appeared in the troublous period of 1860 and 1861, and later reappeared accompanied by a lowering of public morality due to the influence of whiskey and the presence of many soldiers. An increased supply of money gave the people the opportunity to develop new amusements, such as the theatre, and the educational system became centralized and improved. Labor's problem in 1860 and 1861 was that of unemployment, but this disappeared in less than two years and was followed by a period of decreased purchasing power which caused many strikes for higher wages. The city itself escaped from its financial embarrassment, and in 1863 began a series of long needed city improvements. Nevertheless, throughout the period many people had to depend upon charity, and this number was greatly increased during the war by needy soldiers' families.

Wheeling's population increased through immigration, and the negro population of Ohio County tended to become concentrated there. The housing situation became so acute that dwelling houses could not be had at any price. The older population, having lived in a region where Northern and Southern ideas mingled, generally did not share in the radical feeling which developed in many of the Northern cities. Yet some few did mistreat the negro, although the

people were fairly tolerant of Southern sympathizers. The churches enjoyed a material prosperity, but it is doubtful whether this was accompanied by any great increase in membership.

THE DETERIORATION OF POWDERED MILK: A POSSIBLE
REACTION BETWEEN CASEIN AND LACTOSE AS A
FACTOR IN DISCOLORATION OF MILK POWDER

Harmon Jackson Bailey, B.S. in Edu.,
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Department of Agricultural Chemistry

Powdered milk when stored for long periods of time, under certain conditions, sometimes undergoes a certain type of deterioration in quality, resulting in extreme discoloration (browning). Aside from this it is very insoluble and has an unpleasant odor and taste.

The purpose of this study is to follow up the thesis proposed by McCreary, that milk powder shows a considerable decrease in its casein and lactose content as a result of the browning, and that the following reaction takes place in the browning process:



If this assumption is correct the deteriorated powder should show a considerable gain in moisture content. A study was therefore made on the relation of moisture to the process of discoloration. In all cases throughout the study the process of deterioration was accelerated by heating the samples in an oven at a temperature of 88°C. It was found that the degree of discoloration depended upon the original moisture content of the sample. Powders of an original moisture content of 2.5 per cent underwent much less discoloration than those of 7.5 per cent and 10 per cent moisture. Powders of no original moisture content

presented little or no change in color. In all cases where discoloration took place there was a considerable increase in moisture content and this increase in moisture was found to be proportional to the degree of discoloration.

From these results it became evident that moisture acts as a catalyst in the browning process and that its absence inhibits discoloration.

A study was also made of the effect of P_H on this type of deterioration. Powders of a low P_H (4.4) were found to undergo discoloration to a much lesser extent than those of a higher P_H (6.7 and 7.0).

In order to observe better the relation of casein and lactose to this type of deterioration, these constituents were isolated from the milk. If the suggested reaction is true, mixtures of these substances should behave in the same manner as the milk powder.

Solutions of casein and lactose when heated together gave a strong discoloration and analysis showed a considerable decrease in the Formol titration and reducing power. There was formed in these solutions a light brown precipitate which on hydrolysis reduced Fehling's solution.

When dry mixtures of casein and lactose were heated, a considerable amount of discoloration resulted and when 2 per cent moisture was added a stronger discoloration was obtained. These mixtures after heating had a moisture content of 5 per cent or more and an insolubility of over 80 per cent. Those to which 2 per cent moisture was added showed an increased insolubility of over 1 per cent.

A striking point here is that these mixtures contained only 67 per cent casein, yet after heating they showed an insolubility of over 80 per cent, which would indicate that a considerable amount of the sugar was rendered insoluble.

The brown insoluble material of these mixtures, like that of the solutions gave a strong reduction with Fehling's after hydrolysis.

Since pure mixtures of casein and lactose become brown, insoluble, and show a considerable increase in moisture—in

short behave identically like powdered milk—it is assumed that this type of deterioration is the result of the suggested reaction.



PROCEDURES UTILIZED IN OHIO HIGH SCHOOLS TO SIMPLIFY CLOSING THE SCHOOL YEAR

Philip Edward Baird, B.S. in Edu.,
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Department of School Administration

A definition is first offered for consideration:

“Closing the school year” is an entity, a unity. It embraces the planning and activity necessary to bring about a survey of the past with a prediction of and a preparation for the future. It is not confined to a day, a week, a month, or a year. It is so purposefully conceived and administered that it provides for uniformity of results, completeness of detail, intelligibility of instruction, ease of supervision, and equalization of labor.

The opening and the closing of the school year present it at two of its most critical points. Of the two, the latter is seemingly the more important, for if desirable results are not forthcoming, the passing year has been fruitless and the new year will be without direction and purpose.

The fact that little has been written in a detailed way upon “closing the school year” prompted the writer to look into general practices to ascertain what is being done. The study was carried on through the medium of a questionnaire sent to the principals of Ohio senior high schools with student populations in excess of 250.

Results, in brief, show a high degree of recognition of content and an equally high requirement throughout—but almost unanimously indicate that no unified analysis and organization have been attempted.

The general practice in the schools studied is to allow teachers one-month notice or less, concerning their duties in closing school. The media used for giving instructions are:

<i>Media</i>	<i>Per cent</i>
Teachers' meeting	77
Bulletin	63
Checking sheet	21
Interview with principal.....	21
Instructions of department head.....	7
Advice of old teachers	5
Manual	2

Consideration of the treatment of reports to supervising and accrediting agencies would indicate that their preparation must develop an emergency treatment, since there is no evidence that the sources of data are forever identified, that reports of several years may be comparable, or that a procedure of operations is established so that the collection of statistics is a matter of routine.

Historical data are preserved for posterity in 53 per cent of reporting schools, but there is no uniform method or system in use.

Reports reflect, or should reflect, the accomplishments and deficiencies of the school, and are also the source of conspicuous activity at the end of the year. Some 46 of these reports are listed and found to be required (60 per cent of the schools use 36 of the 46). There is no apparent detailed set-up to carry on the work incident to them, nor a working program calling for division of labor. No attempt is made to set the essential apart from the non-essential.

A distinction is made of duties to be performed and tasks to be certified "complete," and returns indicate that they are commonly recognized and in use. However, when these things are associated with the individuals performing them, no basis for delegation stands out. Principals, obviously, are involved in routine which could better be distributed among the members of the staff. There is no imposition if

assignment is accompanied by a definite plan of assignment, supervision, and administration. The assignment should develop through the medium of a working sheet used as is the schedule of recitations in relation to the classroom.

The school calendar is the tap root of an orderly, effective "closing of the school year." The schools studied in the main have calendars. They are not, however, prepared early nor are they complete in detail. They are concerned with isolated details and are not as a calendar should be—created at one time, authorized at one time, early offered to all concerned as a unit, modified if necessity demands, and kept thereafter before them.

The scheduling of pupils, almost unanimously, is purely on a semester basis. There are a few schools, however, which capitalize the scheme of giving the pupil a high-school career vision. It is believed that such a procedure, redeveloped each semester and changed when necessary, will repay, in time, both in an improvement of guidance and in a lessening of labor.

Opinion in Ohio schools is divided on the matter of final examinations. No attempt is made to advocate or to discount their use. When prevailing, schedules are constructed on the basis of conscious recognition of a number of modifying elements.

The social side of "closing the school" is developed to show the range of events which gorge the last weeks of the year. They are found to range from 4 to 14 in number. There is no doubt that a pruning is needed.

Query invoked the fact that but few of the reporting principals have a complete organization for "closing the school year" as advocated by the questionnaire and this thesis.

Thirty-eight of the principals commented at length, in a favorable manner, upon the treatment advocated. Their comments were used to qualify the organized procedure set-ups in the last chapter of the thesis.

The thesis offers summations of common practices, a definition of "closing the school year," and a suggestive identification of all that may be embraced under the term, to-

gether with a tentative procedure of organization and administration which is offered to the principal to test and modify to fit his needs.

RESULTS OF RECENT SCHOOL-BUILDING PROGRAMS OF LAKE COUNTY, FLORIDA

Frank John Banning, A.B.,
Hiram College, 1923

Department of School Administration

The purpose of this study was to show the inadequate results of the unscientific school-building programs of Lake County, Florida. This County was taken as a cross section of the conditions in the State of Florida. A general consideration of the problem, including quotations from many of the best authorities on school-house planning and construction, will be included in this thesis. Excerpts will be taken from the school-building codes of those states having the better guidance and control of this problem. The study will contain a complete history of the planning and construction of each of the recent and important building programs of Lake County, Florida. The buildings were scored with the Strayer-Engelhardt Score Card for High-School Buildings and Stevenson's Score Card for Elementary-School Buildings. The percentages of floor area used for each of the six main divisions were calculated from the floor plans. The illustrations, both photographs and floor plans, serve as an attempt to give a cross section of the present conditions in the County, while the cost and description of the material used will accompany the illustrations of each case studied.

In the case of the Leesburg High-School-Building Program, 18 out of the 21 possible steps to be taken in a scientific building program were carried out; in the Eustis Pro-

gram 11 out of the 21 possible steps; in the Tavares and Leesburg Grade School Program, 7 out of the 21 possible steps; and in the Mt. Dora, Clermont, and Umatilla Program, 6 out of the 21 possible steps were taken.

There is a positive correlation of .96 between the rank of the scores and the rank of the number of scientific steps taken in these programs. There is also a positive correlation of .24 between the excess non-instruction area and the rank of the number of scientific steps taken in the building programs. This comparison indicates a close relation between the nature of the building program (scientific or unscientific) and the efficiency of the building.

On the assumption that the percentage of floor area allowed by the Candle of Efficiency used in this study is correct, there is a waste amounting to \$57,008.35 in the construction of the buildings considered in this study. This is due merely to the excessive non-instruction area in the buildings. This amount, with the \$22,700 lost in a business transaction involving the site of the Eustis Building, makes a total tangible loss of \$79,708.35 in the building programs of these seven buildings, most of which might have been saved by careful guidance and control. Using this ratio, Lake County has wasted \$130,816.88 during the seven years 1922-1928 inclusive, a loss of \$18,688.13 annually. The State of Florida has wasted \$958,967.28 annually during this period.

It is perhaps needless to add that if a small percentage of this tangible loss cited above were spent in the guidance and control of these building programs, not only this tangible loss could be eliminated but also the intangible as well could be largely obviated.

In the light of these facts the author is recommending an optimum which would be a Division of School Building and Grounds in the State Department of Education or a minimum which would be a Director of Building and Grounds to be appointed by the State Superintendent of Public Instruction of Florida. A school building code would then be formulated, the Division or the Director being responsible for carrying out this work.

REFLECTIVE THINKING IN RELIGIOUS EDUCATION

Paul Emmanuel Bierstedt, A.B.,
Capital University, 1916

Department of Principles of Education

Traditional religious education appears to have conceived religion as a compartmentalized division of human knowledge and experience and, having determined what were the appropriate knowledges and experiences for the adult religious person, to have set about to impose them upon the children. We have conceived religion to be, rather, the integration of all of life's experiences in relation to God or the idea of God, and have set about to find a teaching technique that will accomplish this with our present religious education of the modern child.

A stir has been noticed among religious educators and editors within the last two decades, as they have been attempting to construct a new type of curriculum that will provide for life situations and will help the child adapt himself to them. We discover, however, upon examining the progressive literature of religious education, that although new materials have been introduced, no adequate provision has been made for the child's problems in the religious area nor for the reconstruction of his own experiences as he works out solutions. Their lesson plans still present adult conceived problems and ends, and provide specific materials for accomplishing those ends.

In this world of rapid change it is impossible to predict future situations, religious or otherwise, and, of course, to lay out in advance the problems these situations raise. This is especially true in the wide contacts of religion and morals. In order to help the children meet their situations, it should be the function of religious education to provide the child with an abundance of rich religious and moral concepts and to train him in the technique of intelligent adjustment. As he becomes conscious of religious problems in his own im-

mediate life experiences and finds his own way through them to a conclusion satisfactory to himself, he will become by a continuous process of readjustment an intelligently religious person, both in his child and in his adult experiences.

We have found a teaching procedure adequate to such an educational aim in the technique of reflective thinking. A teaching method built upon the process of the characteristic human behavior in making adjustment to new situations, as suggested by John Dewey's steps in a complete act of thought, provides religious education with a way of directing the religious development of children or of persons of any age as they deal with their own interests and difficulties, so that they will emerge capable of making their own adjustments intelligently.

The teaching procedure suggested has been built around units of learning. Each unit is organized into three periods. The first provides for the orientation of the pupils into the unit by leading them through an assortment of religious concepts and situations which are chosen by the teacher because of the potential problems that may arise out of them. Questions and difficulties begin to emerge out of the experiences of the pupils with these materials. Their concerns and interests grow out of their felt problems and under the guidance of the teacher are correlated and stated. This we have chosen to call the period of adventure.

After the class has located the various problems that have grown out of the orientation period and has, perhaps, suggested possible solutions, the teacher directs the pupils to appropriate readings and activities that will help them find for themselves the data in support of the suggestions they bring to their problem. Then they set to work at their individual readings or at individual or group enterprises, gathering data and testing hypotheses and conclusions for themselves. This period of supervised work and study we term Discovery and Investigation.

The final period of socialized recitation provides the opportunity for all the pupils to bring their findings and con-

clusions to the class for open discussion. Everything is thoroughly tested by the pupils under the guidance of the teacher, until the conclusions to their problems are settled beyond reasonable doubt. This period we call Recovery and Possession.

A course of lesson outlines for such a procedure can only be by way of suggestion and illustration. The broad outline or scheme will indicate the procedure; on the other hand, the problems of the children cannot be predicted with complete certainty. Further, until the problems have arisen and been stated, the reading references cannot be made nor can the subsequent study, work, and recitation follow. Such a procedure demands a teacher with a wide acquaintance with materials and a sympathetic attitude toward the children's own problems, and especially a teacher with a thorough acquaintance with the technique of thinking and a desire to train the pupils in that method of reflection.

AN EVALUATION OF THE EVERY PUPIL GENERAL SCIENCE TEST GIVEN DECEMBER 10, 1929

Melvin Russell Bixler, A.B.,
Mt. Union College, 1922

Department of Principles of Education

On December 10, 1929, an Every Pupil Test was given in the high schools of the State of Ohio under the direction of the State Department of Education. This thesis is a study of the general science questions of that test.

The questions were examined to determine: (1) their possibilities of stimulating different types of thought, the knowledge required for answering, and the worth of that knowledge; (2) the special sciences covered by the test; (3) the relation of the questions to general science objectives; and (4) the vocabulary content of the test.

Most of the one hundred questions in the test had the possibilities of stimulating some thought, but many of them were ambiguous. They were not definite and permitted more than one interpretation. All of the questions contained knowledge of scientific value, with a few questions of doubtful value for general science.

The special science content of the questions and their relation to general science objectives closely followed the textbooks.

Eighty-two words, in the test, 72 of which occurred but once, are not found in the Thorndike Word Book. Only six of these words are not commonly found in general science textbooks, and so their not being in the Thorndike Word Book is not necessarily a weakness of the test.

A study of teaching practices in the State of New York where the Regents examinations are used or in California where the county system was in effect, reveals the tremendous influence of an examination system. Undoubtedly, the Every Pupil Test in Ohio will influence teaching. In fact, one of the purposes of those directing the test was to influence teaching by pointing out weaknesses in present methods that should be remedied.

This study of the general science questions does not confirm the test as a valid basis of judgment. There are too many ambiguous statements and there is too much knowledge the value of which, for general science, is questionable.

If questions are to be used to test pupils' knowledge and the results used to judge the teaching, they should be most carefully constructed. Perhaps the care used should be no less than that in making Standard Tests. Until such care is exercised, the results of the test should not be taken too seriously.

A COUNTY GUIDANCE BUREAU FOR THE SCHOOLS OF MONTGOMERY COUNTY, OHIO

Harold Longman Boda, A.B.,
Otterbein College, 1925

Department of School Administration

The purpose of this study is to show the need, possibilities, and limitations of a county guidance bureau for the public schools of Montgomery County, Ohio, and to produce a plan for such a bureau. The bureau would be in, or an adjunct to, the county superintendent's office and would be made up of a staff of experts in the various fields of guidance. The applications of the results of the problem to other counties of Ohio have also been mentioned.

As a result of a survey of existing guidance organizations, one county guidance organization was found in Craven County, North Carolina.

A study by means of a questionnaire of the status of the present guidance situation in the seventeen junior, six-year, and senior high schools of Montgomery County revealed an interest in guidance and scattered unorganized efforts along this line. There is a lack of organized guidance work.

Information from 3051 students, secured by sending out 5000 student questionnaires to the schools included in the study, showed definite need of guidance. An interesting phase of this part of the study was the occupational choices of this group of students. A study of failures for one year and of work certificates issued for the last four years also revealed need for guidance work.

Local agencies such as the Dayton Mental Hygiene Clinic and the Dayton Coöperative High School would be of help in a guidance program in this county. The attitude of the county superintendent and local principals and superintendents is exceedingly favorable to such a project.

The only legal possibility by which the county board of education can employ guidance specialists would be pro-

vided by the section of the Ohio School Law which provides for the employment by county boards of education of assistant county superintendents for special lines of work. The State pays \$750 of each assistant county superintendent's salary, but the appropriation made by the State Legislature is insufficient.

The Montgomery County Board of Education and the local boards of education in the County are unable to give financial support to such a bureau at present.

It is therefore impossible at present to set up a bureau of guidance specialists in Montgomery County because of a lack of finances.

Because of the above fact, two plans are suggested for organizing guidance work in this county. The first requires little financial outlay and is therefore suggested for immediate use. It is organized around committees of teachers, principals, and superintendents.

The second plan suggested is the final goal and provides for a staff of specialists to serve the schools of the county, none of which can individually afford such services.

THE OPERATION OF THE BING LAW IN HIGHLAND COUNTY, OHIO

Cloyce Eugene Booher, A.B.,
Defiance College, 1925

Department of School Administration

The Bing Law (Ohio's compulsory school attendance law) requires every child between six and eighteen years of age to attend a public, private, or parochial school during the regular school year. Age and schooling certificates are granted to children for the purpose of allowing them to engage in regular employment. The standard certificate is issued to those who are at least sixteen years of age and

through the seventh grade. The conditional non-standard may be issued to those who are sixteen years of age and unable to pass the seventh grade, providing one of the following facts can be proved: (1) that the child must support himself or members of his family; (2) that the child is not sufficiently familiar with the English language to be properly instructed in the full-time day schools of the district; and (3) that the child has moved into the district since the beginning of the last annual school session and that instruction adapted to his needs is not provided in the regular schools of the district. The non-standard retarded is issued to those children above fourteen years of age who have been adjudged by the state department of education to be incapable of profiting by further instruction. Therefore, children between the ages of fourteen and seventeen, inclusive, are directly affected by the Bing Law, and they are the ones upon whom this study is based.

The purpose of this study is to determine: (1) the factors that tend to eliminate the child from school; (2) the degree of certification; (3) the need of the seventh-grade requirement; and (4) the conditions that prevail as a result of the child's employment.

In order to determine the number of children to be studied, the name of each child fourteen to seventeen years of age, inclusive, found on the census sheet for May, 1929, was checked with the school enrollment. One thousand two hundred and fifty-one were attending the public schools; one hundred and twenty-two children, designated as the eliminated group in this study, were either working or idle. The children who were married, away at college, and so forth, were not counted in the study.

The size of the home, the parents' attitude toward school, and the child's dislike for the course of study were found to be outstanding factors in elimination from school for the eliminated group. Over one-half of the children who were out of school did not possess working certificates. The seventh-grade requirement might be a stumbling block for only 6 per cent of all children enrolled in the Highland

County Schools. A very small number of children were fully supporting their families; although the majority of the working children were contributing in some way to the support of themselves and their family by paying board and buying their own clothes. Only 10 per cent were able to save money.

The operation of the Bing Law appeared to be very discouraging when only the eliminated children are considered. However, when the violators of the law in this group are compared with the total population group, only 4 per cent of all children fourteen to seventeen years of age, inclusive, are violating the Bing Law. Therefore, whenever the school officials of Highland County exert a little more effort in bringing these few violators to task, the Bing Law can be said to be a very effective and desired piece of compulsory education legislation.

THE EFFECT OF HIGH MAGNETIC FIELDS ON THE EMISSION OF SPECTRAL LINES

Donald Whitney Bowman, A.B.,
Mt. Union College, 1929

Department of Physics

The purpose of this problem has been to repeat some of the typical experiments which have been performed on the Zeeman effect. A study was made of the pattern of the Zinc triplet $\lambda = 4680 \text{ \AA}$., 4722 \AA ., 4811 \AA .; the copper doublet $\lambda = 3247 \text{ \AA}$., 3274 \AA .; the tin lines $\lambda = 3175 \text{ \AA}$., 3262 \AA .; and the lead lines $\lambda = 4245 \text{ \AA}$., 4386 \AA .

The apparatus used consisted of an arc source mounted in a vacuum box between the poles of an electromagnet, and an Eagle's mounting of a concave grating spectroscope.

The zinc line $\lambda = 4811 \text{ \AA}$. was a nonet of the type $0.1/2.3.4/2$; the pattern of the line $\lambda = 4722 \text{ \AA}$. was a sextet

of the type $1/3.4/2$; and the pattern of the line $\lambda = 4680$ A. was a triplet of the type $0/2/2$. The shift in wave length for these lines and the normal shift observed are given in Table I.

TABLE I
Zeeman Pattern for the Zinc Triplets

Shift (4810).	.742	.551	.362	.175	.000	.189	.370	.551	.726
Normal shift	...	...	...	...	...	...	.364	...	...
Shift (4722).	.695	.496	...	.165	...	.172	...	.501	.696
Normal shift	...	...	...	...	...	...	.338	...	...
Shift (4680).	...	...	.322	...	.000	...	.326	...	...
Normal shift	...	...	...	...	...	...	.324	...	...

The field was calculated for each pattern, and the average taken by weighting as 32,917 gauss.

The copper line $\lambda = 3247$ A. was a sextet of the type $1/3.5/3$ and the line $\lambda = 3274$ A. was a quartet of the type $2/4/3$. The normal shift was calculated from the value of the field found above. The separations and normal shift observed and the normal shift calculated are given in Table II.

TABLE II
Zeeman Patterns for the Copper Doublet

Separation (3247) .....	.274	.170	.055	.056	.174	.287
Normal shift	Calc.	.161	...	Obs.	.169	...
Separation (3274) .....	...	.332	.104	.104	.224	...
Normal shift	Calc.	.165	...	Obs.	.162	...

The tin line $\lambda = 3175$ A. and the lead line $\lambda = 4386$ A. are asymmetric triplets, and the tin line $\lambda = 3262$ A. and the lead line $\lambda = 4245$ A. are symmetrical triplets. The observed and calculated normal shift and the pattern are given in Table III.

TABLE III
Zeeman Effect of Tin and Lead Lines

	Line	Obs.	Shift	Calc.			Pattern	
Sn.	3175	.225	.212	.156	1.442	0	1.359	Asymmetrical
	3262	.142	.142	.163	.855	0	.855	
Pb.	4245	.199	.200	.278	.739	0	.739	Asymmetrical
	4386	.200	.178	.297	.675	0	.600	

A PLAN FOR THE TEACHING OF SOCIAL STUDIES IN THE GIRLS' CONTINUATION SCHOOL OF COLUMBUS, OHIO

Pauline Temperance Bryant, B.Sc. in Edu.,
The Ohio State University, 1918

Department of Principles of Education

With the understanding that education is growth, and that the aim of education is continued capacity to grow, a discussion of principles centers about aims, motivation, interest, the democratic ideal in education, vocational ideals, use of leisure, function and selection of subject matter, and growth. It has been said that the true tasks of a teacher are guiding, expanding, and stimulating.

Analysis shows that continuation girls, on the whole, are two years retarded in their school work, and that they come from homes representing lower economic strata of society. In many cases, their families have been helped by social agencies. They are often indifferent, if not actually hostile, to school.

The plan of teaching social studies in the Girls' Continuation School of Columbus, Ohio, covers the six major social groups in which every girl has a part—the home, the school, the church, occupation, recreation, and the community.

The time allowed for teaching social studies is one hour of the four required by law for school attendance each week, making a total of seventy-two lessons in seventy-two clock hours during a two-year period.

In general, each social group is allowed one-sixth of the time, or twelve weeks.

The leading features of the plan are: (1) reading to understand the scope of the problem; (2) formulation of questions the girls would like to have answered concerning local conditions; (3) interviews with proper officials to obtain information; and (4) reports to the class.

Five advantages accrue from this plan of teaching:

1. It secures genuine interest on the part of the girls.

2. It meets administrative needs of the school.
3. It may accommodate all grades of mentality in one class.
4. It gives pupils a selected environment.
5. It is stimulating to the teacher.

THE HALDANE MISSION OF 1912

Horatio Milo Bugby, A.B.,
Oberlin College, 1922

Department of History

The Haldane Mission to Germany came about as a result of the naval competition between Germany and England. Haldane went to Berlin for the purpose of arriving at some understanding with regard to mutual limitation of naval armament. The attempt of the greatest military power, Germany, to threaten the naval supremacy of England, seemed to the latter to endanger her island security.

England made many attempts between 1905 and 1912 to lessen the competition and come to an understanding. She always maintained that her navy should be equal to a combination of any two powers. These advances did not seem conciliatory to Germany, as England seemed to want the competition to cease when her own navy was at the peak of its strength, and after the building of the Dreadnought, which, contrary to the first English thought, had given Germany a distinct advantage. Negotiations were again opened in 1912. Grey himself was unwilling to go. He gave the excuse that he felt the affair was a petty, unofficial one which might be avowed or disavowed as best suited the German fancy; but his main reason was his fear of impairing the friendly relations with France.

Haldane, Minister of War, was accordingly sent to Germany to explore the ground and make ready for later official

understandings. He was only "superficially" acquainted with naval affairs, and consequently made concessions with regard to the "Novelle" which England was later forced to retract.

Bethmann-Hollweg did his best to arrive at some understanding. His opponent was the bellicose Admiral Von Tirpitz, who opposed any concession which might impair the ultimate realization of his life work, the building of a "risk navy." The Chancellor wanted a neutrality agreement on England's part in return for a marked reduction in the proposed new navy law. This declaration of neutrality would have tied England's hands in the contingency of war between France and Germany. It would have prevented England from coming to France's aid in the case of the threatening of the Channel Ports, in view of which the Haldane reorganization of the Expeditionary Forces had taken place. Such an agreement the Francophile Grey could not sign.

England was just as unreasonable. She maintained that the initiative for any reduction lay with Germany. She would lay down two keels for every one that Germany might build. When asked what reduction in the proposed German navy bill she desired as a condition for a political agreement, Churchill said that she would prefer no increase at all. This uncompromising attitude, and the fact that Grey seemed to be retracting from the concessions Haldane made at Berlin, led to mutual distrust and to the raising of Germany's demand for the neutrality agreement to one of absolute neutrality, which England could not promise.

The Haldane Mission technically was a failure, but it led to freer and more open discussion of their mutual commercial opposition and to an agreement over their African differences which was terminated by the outbreak of the World War.

THE MARKETING OF COTTON IN ALABAMA

Orin Everett Burley, B.S. in Com.,
Oklahoma Agricultural and Mechanical College

Department of Business Organization

For a number of years the quality of cotton staple produced in Alabama has steadily declined. In this study an attempt has been made to show (1) the causes for this decline in quality staple, (2) the effect of this decline on marketing channels, and (3) the efforts made to improve both production and marketing conditions. Because of the limited scope of the project, attention has been largely directed to local cotton market conditions, including the coöperative association, as they affect the above points.

One of the primary causes for the decline in quality staple—43 per cent of the total crop being below $\frac{7}{8}$ inch in length in 1929—was the necessity of producing small-boll, early maturing varieties. This in turn was the result of the ravages of the boll weevil, which began about 1912. The weevil is most harmful during the latter stages of the production season, and this naturally caused producers to change to varieties that would mature early. Another primary cause for the decline in the quality of cotton staple in Alabama has been the failure of local market buyers to give proper premiums for quality cotton. A common practice has been to follow the system of averaging prices, to the detriment of cotton of the better grades.

With the decline in quality of staple came the problem of a market for the poorer quality product. The domestic mill consumption in Alabama has been rapidly increased and now consumes a large part of the Alabama yield in producing "coarse goods." The Piedmont Valley mills of North Carolina and Georgia, producing a similar type of product, are also large consumers of Alabama cotton. The foreign demand for poor grade cotton is limited, and takings are low, especially in good production years. Cotton

below $\frac{7}{8}$ inch in staple is untenderable on future contracts and this, too, tends to limit the market.

Through the efforts of the Alabama Farm Bureau Cotton Association, the Alabama Polytechnic Institute, and the Extension Service, a concerted effort has been made to improve the varieties of cotton planted in the various sections of the State. Work has been largely directed to the introduction of large-boll, early maturing varieties, and there are indications that success is beginning to meet their efforts. Studies have also been made and published on the effect of the disreputable conditions existing in local cotton markets. Thus, with the growing competition offered by the better private houses and by the Farm Bureau, both of which purchase according to grade and staple, the trend is toward a more standardized marketing practice.

LEGENDARY ELEMENTS IN MODERN IRISH DRAMA

Anna Agnes Cawley, A.B.,
West Virginia University, 1921

Department of English

In a preface, four chapters, and an appendix, the legendary elements in Modern Irish Drama are presented, and their use and disuse are discussed with proper reasons for each. To a greater degree than in any other country is the story of the rebirth of the drama in Ireland inseparably linked to that of the theater. W. B. Yeats and Lady Gregory gave direction and support to the desire for a national drama born in despair. This was in 1899. The deep bitterness on the part of the Irish people against England and the urge to create a distinctly Irish literature led to the Irish literary renaissance, an important phase of which was the drama. These pioneers wanted a theater and drama not only reflecting the thoughts and lives of the Irish people,

but also serving to correct the absurd notion of Ireland and Irishmen spread far and wide by English and American dramatists.

Legendary material was first turned to because it offered an immediate escape from the poverty, violence, and factional strife surrounding the material existence of poets and people alike in the first years of the twentieth century. Four purposes guided the early dramatists in seeking material for their plays. These were: (1) to escape from the present and to present the protest of idealism against materialism; (2) to clothe these thoughts and perpetuate them in a poetic language; (3) to make real and active the folk history of Ireland; and (4) to instill a greater patriotism in the Irish as a race. The dramatists felt that the drama was the perfect means by which a spiritual conception of Celtic destiny could be best presented to the people. With these ideals clearly understood by all, it was but natural that in most instances the dramatists turned to the legends dear to many Irish people.

In the discussion of which this is but a résumé, the total number of plays produced from 1899 to 1928 is presented, and special emphasis is placed on the legendary plays. Their popularity, growth, and eventual decay are, I hope, adequately explained and illustrated.

The works of Lord Dunsany are delayed until the appendix because they are without rather than within the pale of my investigation.

THE PSYCHOLOGICAL APPROACH IN GENERAL SCIENCE INSTRUCTION

Gerald Howard Chapman, B.S. in Edu.,
Kent State Normal College, 1925

Department of Principles of Education

The object of this study is to determine whether or not changes have been made toward modern teaching prac-

tices in the writing of textbooks. The following series of six criteria is set up to serve as a basis of judgment.

1. Does the unit start with the child's past observation and knowledge?

2. Are the consecutive steps so arranged that he gathers his own data, or does the book state them empirically, or are both done?

3. Does he progress from the simple to the more complex in a psychological manner, each step being based on the preceding work and growing both naturally and logically out of it?

4. Is he stimulated to organize, compare, and tie up his data with past knowledge?

5. Are opportunities presented in which he can test his hypothesis?

6. Are drill exercises presented to aid him in fixing the necessary facts in mind?

The same unit covering the topic "Air," has been examined in each of six textbooks. The books range in copyright dates from 1916 to 1930. Each question of the criteria is considered separately with reference to each of the six books. Several typical selections or entire paragraphs are quoted from the text under examination for the purpose of analysis. The findings on each book are summarized and a final collective summary of all six books is included after the survey of the last book.

It was found that none of the textbooks examined had followed the psychological method of developing subject matter as set forth by the criteria. However, this does not mean that the books may not have in them important elements of great value. It does mean, though, if the criteria are correct, that the most likely method of aiding the child has not been followed. The burden, then, is placed on the teacher, for unless she treats the subject matter psychologically, the greater part of the class will not acquire the necessary understanding nor the right attitude and ability in learning.

The writer, keeping the criteria in mind, has attempted in the last section to write a similar unit in which the psychological treatment of subject matter is exemplified. If the teacher works out some such arrangement of subject matter, any of the general science textbooks in common use today may be used more advantageously with it than without it. The textbook, under this plan, would become a reference book, serving to enrich the meaning as well as to increase the amount of information secured.

TEACHING CHILDREN TO THINK THROUGH THE USE OF HISTORICAL SOURCE MATERIAL

Vera Morris Chapman, B.S.,
Kent State Normal College, 1925

Department of Principles of Education

The aim of education today is to assist a person to make the most efficient relations possible within the social organization of which he is a member. In order to do this he must be able to reconstruct experiences to serve his present needs. In other words, he must be able to do reflective thinking.

The study of historical sources offers a good opportunity to develop reflective thinking through the building of concepts by the unravelling of the symbol which stands for that concept. This may be done by various forms of analysis.

This process of analysis includes the formation of inferences and implications which are pointed to by the word, phrase, extract, or picture. Several methods of procedure have been suggested and worked out, namely, by diagram, by narrative, by outline, by questions, and by pictures. These various methods ought to bring forth meanings or ideas which challenge the child to justify their acceptance by further search among the authorities.

Ralph Ernest Clarridge—Joint Thesis with David William Armstrong (see page 3).

A STUDY OF EDUCATIONAL AND VOCATIONAL GUIDANCE IN THE SENIOR HIGH SCHOOLS OF WEST VIRGINIA

Edgar Holmes Coberly, B.A.,
Davis and Elkins College, 1925

Department of School Administration

This study is an attempt to ascertain the principal facts in regard to the organization and administration of guidance programs in the senior high schools of West Virginia. The data discussed in the study were obtained from questionnaires filled out and returned by eighty-seven high-school principals. These schools represent the different types and sizes of the senior high schools in the state. The data show:

1. The work of securing and recording information about the individual pupil has been largely neglected in West Virginia high schools.

2. The schools studied were meeting approved standards of curricular organization as far as local conditions would permit. Certain subjects that are recognized as being particularly valuable for guidance purposes were generally offered.

3. The importance of the individual pupil was generally recognized, and the majority of schools made some provisions for individual differences. The most common methods were: acceleration, supervised study, and enrichment of the work of bright pupils.

4. The guidance values of extra-curricular activities were not being made the most of by West Virginia high schools.

5. Pre-guidance was not being given the consideration it deserves.

6. Few schools provided placement service for their present and former students and while quite a few followed up former students, this was seldom continued long enough.

7. Very few schools had a regular counselor, but a considerable amount of individual guidance counseling was given by principal and teachers.

8. Only one-fourth of the schools studied had a definite organization for purposes of guidance.

9. A majority of high-school principals were trying to improve their guidance programs and were making attempts to apply certain measures of their success.

In view of these findings, certain general recommendations can be made for West Virginia high schools.

1. Every school should adopt an adequate system of permanent records.

2. The guidance values of all curricular and extra-curricular activities should be utilized to the utmost.

3. Greater consideration needs to be given pre-guidance, follow-up, and placement.

4. Every school should adopt a guidance program fitted to local needs and should effect an organization that will admit the most efficient administration of this program.

HISTORICAL INTIMATIONS OF THE IDEA OF PHYSIOLOGICAL GRADIENTS

Jacob Cohen, B.A.,
The Ohio State University, 1929

Department of Psychology

In very recent times such men as Professor Child and Professor Parker have been able to formulate a conception of the living organism in terms that are free of all the difficulties previously experienced. The idea, which they have designated as physiological gradients, is an explanation which tries to experience the unity and the organization of

the system in terms of a process or a mode of the progress of behavior. This idea of physiological gradients seems to me to be hinting—to be intimating—a type of explanation which may someday be much more fully worked out. The Greek word *physic* is derived from the verb *phyo*, which means “to flow.” The thought that the coiner of this word had was that nature is a process of flow, some sort of a system in which the present evolves from the past. Such a derivation has been explained by the theories briefly mentioned, in terms of which eternal atoms are changing their relationship. They are the same old atoms but their combinations are new. From the standpoint of the physiological gradient idea, I seem to find the possibility of an explanation that is free of all these metaphysical atoms and also free of all the absolutes of Euclidean space and time.

What the nature of this process is remains to be determined, but if we could conceive of such a principle as that of physiological gradients, which is so successfully applied to the physiological activities of the organism, as being also applied to the total behavior segments of the organism, we could have a psychological theory which would do its explaining in empirical and not in metaphysical terms.

Certain features of Gestalt psychology, of the present-day relativity theory, and the notion of physiological gradients, fused together into a unitary system, can explain all the facts that belong to the field of psychology.

INSECTS INFESTING *Typha* AND THEIR PARASITES

Arthur Charles Cole, Jr., B.A.,
The Ohio State University, 1929

Department of Zoölogy and Entomology

The author has collected during the period from 1927 to 1930 inclusive, a total of fifty-two insects from *Typha* plants, popularly known as cat-tails.

The insect fauna of *Typha* represent four large orders: the *Lepidoptera*, the *Diptera*, the *Hymenoptera* and the *Coleoptera*. Among the other orders represented are: the *Hemiptera*, the *Orthoptera* and the *Thysanoptera*.

Representative *Lepidoptera* on *Typha* consisted of a number of boring larvae from which a large quantity of parasites were reared. Parasites were collected from practically every insect found by the author, from which group two were determined as new species.

The writer has classified the insects collected from *Typha* according to their external morphology and also according to their ecology, that is, their relations to the various areas of the host plant.

The areas selected for the collection of the material of this paper represent typical locations of *Typha* associations and include sections of five states: Ohio, Michigan, Florida, Montana, and Idaho.

The insects are listed as identified by specialists of the United States National Museum at Washington, D. C., and in most cases are determined to species.

The paper includes a supplement of thirty-one plates and one map, together with a bibliography containing a list of thirteen references.

The insects reared from *Typha* are as follows:

Lepidoptera:

- Arsilonche albovenosa* Goeze
- Apatela obliterata* Abbot and Smith
- Endothaenia hebesana* Wlk.
- Lymnaecia phragmitella* Staint.
- Coleophora* sp.
- Nonagria oblonga* Grote.
- Nonagria subflava* Grote.
- Arachnara subcarnea* Kell.
- Arazama obliqua* Walk.
- Bactra maiorina* Hein.
- Cacoecia rosaceana* Harr.
- Archips obsoletana* Walk.
- Dicymolomia julianalis* Walk.

Diptera:

Platychirus quadratus Say.
Chaetopsis aenae Wied.
Macrosargus clavis Wied.
Cryptochaetum sp.
Drosophila sp.
Elachiptera nigriceps Loew.
Exorista larvarum L.
Muscina stabulans Fall.
Masicera senilis Rond
Corodonta dorsalis Lw.
Aphiochaeta chaetoneura Mall.
Sturmia nigrata Town.

Coleoptera:

Calendra pertinax Oliv.
Mononychus vulpeculus Fab.
Paria canellavar atterima Oliv.
Notaris puncticollis Lec.

Hymenoptera:

Eurytoma bicolor Walsh.
Blacus sp.
Macrocentrus ancylivora Roh.
Pimpla inquisitoriella D. T.
Microbracon sp.
Rogas stigmator Say
Sceliphron caementarium Drury
Casinaria genuina Nort.
Eulophus sp.
Diaulinus pulchripes Cwfd.
Tumidiscapus sp.
Macroteleia sp.
Tumidiscapus sp.
Aleiodes intermedius Cress.
Apanteles cinctiformis Vier.
Elachterinae sp.

Hemiptera:

Ischnorrhynchus resedae Panz.
Siphocoryne nymphaenae Linn.
Aphis avenae Fab.
Rhopalosiphum dianthi Schrank.
Rhopalosiphum persicae Sulz.
Aphis gossypii Glov.
Macrosiphum granarium Kirby
Hyalopterus arundinis Fab.

Orthoptera:

Conocephalus sp.

Thysanoptera:

Thripsaphis ballii Gill.

A STUDY OF AN A-B-C POWER UNIT USING THE RAYTHEON
TYPE B-A TUBE AS A RECTIFYING DEVICE

George Richard Constien, B.A.,
Ohio Wesleyan University, 1923

Department of Physics

The purpose of this investigation is to determine the possible adaptations and efficiency of a Raytheon A-B-C power unit under various conditions of operation. This unit was constructed strictly according to the directions given by the Raytheon Manufacturing Company. It uses as its control device the Raytheon type B-A, 350 milliampere tube.

Although this tube was designed primarily to serve as a means of supplying A-B-C voltages for radio receivers, it is very satisfactorily used to supply current for amplifiers, and for any other device which requires a non-pulsating, direct current of not over 350 milliamperes.

Procedure:

This investigation is divided into five parts, as follows:

Test I

The output voltages under no load were determined.

Test II

The efficiency of the set operating through a lamp bank was determined.

Test III

The efficiency of the set operating through a standard 201-A detector tube was determined. The results of this test show the efficiency of the set operating under conditions under which the tube was expressly intended to be used.

Test IV

Starting with an output voltage of 10, the filament current of the 201-A tube was varied through its recommended operating range, and the efficiency determined. Then the output voltage was increased to 30 and the efficiency observations repeated. Thus a series of tests were secured showing the relation of output potentials, filament currents, and efficiencies up to an output voltage of 280.

Test V

In this part of the investigation the quality of the current produced was obtained by taking a number of oscillograms at different points in the circuit. This also gives an excellent idea of the relative values of the various parts of the filter system in "smoothing out" the current.

In the first four parts the results are shown by the use of tables and graphs.

Conclusions:

Where data are available, the Raytheon power unit is compared with similar control devices as to construction, ruggedness, quality of current produced, and efficiency of operation.

AMERICAN FOREIGN TRADE ZONE POLICY AND ITS APPLICATION TO HAMPTON ROADS

Hilbert Dell Corey, A.B. in Edu.,
The University of Michigan, 1927

Department of Business Organization

The foreign trade zone or free port has never been a subject of great popular interest in this country. It has received sporadic consideration in governmental and shipping circles for a half-century, but only in the past decade has persistent agitation for the establishment of such zones developed. This recent movement has its origin in the problems of American trade which have arisen out of the World War. Excess shipping capacity and the desire to stimulate foreign trade are the underlying factors. That the movement has made only limited progress is due chiefly to inertia and lack of effective organization.

It has been thought that the transshipment trade of the United States is too slight to warrant the operation of foreign trade zones. Analysis of European free ports, however, raises a serious question regarding the necessity of transshipment trade for the successful operation of the port. It seems that the success of the port lies not so much in the absolute amount of its transshipment trade as in the potentiality of transshipment.

Drawbacks and bonded warehouses are not a satisfactory substitute for areas free from customs duties. It is true that the weaknesses of the former are partly administrative, and revision of regulations governing them is desirable. A weakness which no amount of revision can overcome, however, is the inherent problem of identification of the goods imported and subsequently reexported. This handicap imposes definite limitations upon the usefulness of drawbacks and bonded warehouses, and only through the operation of a zone essentially on the free-port basis, can this difficulty be avoided.

Rates on export cargo to Europe are considerably higher than those on import cargo. American exports to that continent greatly exceed our imports; hence inbound traffic is keenly competitive and rates are low. This is well illustrated in the foreign trade of Hampton Roads. The excess of imports over exports in our South American trade gives rise to a situation exactly the reverse. Transshipment trade may well be both a cause and a result of free-port operation. Its development in this country as a result of the aid of foreign trade zones would tend to equalize inbound and outbound traffic, would encourage more regular and more direct steamship services, and would result in economies not only to the parties directly involved but also to American producers engaged in export and import trade.

Evidence seems to support the view that a foreign trade zone might operate successfully in a favorably located and well-equipped American port, such as Hampton Roads.

THE BAND SPECTRA OF CARBON MONOXIDE AS EXCITED BY THE ELECTRODELESS RING DISCHARGE

Jack Chilton Cotton, B.A.,
Maryville College, 1929

Department of Physics

Identification of the principal bands in the spectra of carbon monoxide as excited by the electrodeless ring discharge is included in the thesis on a microphotometer record of the spectral region 2250 to 3300 Angstroms. The results of the research are compared with those of Herzberg¹ who also investigated the carbon monoxide spectra in the electrodeless ring discharge. The following results obtained differ from his: (1) the Cameron bands appear in the spectra; (2) the 1-1 band of the 3A series appears quite strongly; (3) there is spectroscopic evidence of free oxygen

¹ *Zeit. für Phys.*, 52, 815 (1929).

in the discharge; (4) the pressure drop in a discharge, said by Herzberg to be a result of carbon dioxide freezing out in the liquid air trap, is shown probably to be almost entirely an adsorption phenomenon. An entirely different pressure behavior at higher excitation levels is found.

A short discussion of the advantages of the electrodeless discharge as a light source for spectroscopic work is given. The further advantage obtained by the use of undamped oscillations such as those employed in this work is pointed out. Discussion of the apparatus includes a wiring diagram of the 75-watt continuous wave oscillator and a photograph of the 12-liter discharge sphere in operation.

Among other spectroscopic results of the work are: obtaining of the band at 2760, found by Kaplan²; unquestionable intensity changes within the fourth positive group under different degrees of excitation; and growing prominence of the Cameron bands with increasing excitation energy.

THE POSITION OF THE COUNTY SCHOOL ADMINISTRATOR

A Study of the Relationship of Training, Experience, and Tax Duplicate to Salary, Together with Suggested Legislation in County School Administrative Positions in Ohio

Otis Odell Crawford, B.A.,
Ohio Wesleyan University, 1901

Department of School Administration

This study deals with the status of the county school superintendent and the assistant county school superintendent. The major problem of the study is to determine whether or not there is any correlation between the training

² *Phys. Rev.*, 35, 1298 (1930).

and the salary, between the experience and the salary, and between the tax duplicate and the salary of the county school superintendent and of the assistant county school superintendent. The study is based on data secured from a questionnaire sent to the county school superintendents and assistant county school superintendents by Dr. J. L. Clifton, State Director of Education. Eighty-one of the 88 county superintendents and 66 of the 69 assistant county superintendents answered the questionnaire.

The Introduction deals with the Chadsey report to the Department of Superintendence on the "Status of the City Superintendent" in 1923; Steiner's report to the National Education Association on "The County Superintendent" in 1923; Driver's report to the National Education Association in 1923' on "The County Superintendent's Problems"; and Burris' report to the National Education Association on "The Necessity of the County Unit for the Efficient Administration of Rural Schools."

The second chapter gives a brief history of school legislation in Ohio during the past century, especially that legislation dealing with the rural schools. The second chapter deals especially with the organization of the county school district in 1914.

The third chapter deals with the election of the county board of education, with its duties, powers, and limitations. It also shows the limited power of the county board of education in comparison with the city board of education.

Chapter IV discusses the county school superintendent in regard to qualifications in training and experience. It also treats of his duties and his relation to the county school district. In this chapter the terms "training" and "experience" are defined.

Chapter V deals with the relationship of training to the salary of the county school superintendent. There are 41 of the 81 superintendents answering the questionnaire who have the Bachelor's degree. Twenty-five have the Master's degree and 2 have almost completed the work required for the Doctor's degree. As shown by Table I, the county

superintendents are divided into 6 groups, corresponding to their educational training. Pearson's formula was used to compute the correlation coefficient of the relationship of training to salary. The correlation is found to be .284.

Chapter V deals with the experience and salary of the county school superintendent. Table II shows the relationship between the experience and the training of county superintendents. In this table there are 9 groups arranged according to the number of years of educational experience of each superintendent. Nearly 23.5 per cent of the superintendents reporting are found in Group VI of this table. The average experience of this group is 28.2 years. By use of the Pearson formula the correlation between experience and salary of the county school superintendents is found to be $-.0618$.

Chapter VII considers the relationship between training and salary of the assistant county superintendent of schools. In Table III of this chapter, the superintendents were listed according to years of training. Of the 66 assistant county superintendents reporting, 31 have the Bachelor's degree; 16 have the Master's degree; and 2 have almost completed the work for the Doctor's degree. By the use of Pearson's formula the correlation coefficient between training and salary of the assistant county school superintendents is found to be .288.

Chapter VIII considers the relationship between the experience and the salary of the assistant county school superintendent. In Table IV, as given in this chapter, the superintendents are divided into 9 groups. By the use of the Pearson formula the correlation coefficient of relationship between experience and salary of the assistant county superintendent is found to be .200. This is positive, while that of the county superintendent for the same kind of relationship is negative.

In Chapter IX, Table V shows the relationship between the tax duplicate of the county school district and the salary of the county superintendent of schools. By the use of Pearson's formula the correlation coefficient of relationship

between tax duplicate of the county school district and the salary of the county school superintendent is found to be .5915.

In comparing the correlation coefficient of the relationship of training to salary, of experience to salary, and of tax duplicate to salary, it is found that the highest correlation is found to exist between tax duplicate and salary.

Recommendations:

1. The county should be made the unit of taxation, and the county board of education a taxing body.

2. The county board of education should be given authority to fix school boundary lines regardless of local authority.

3. The assistant county superintendent of schools should be made a supervisor and not an administrator.

4. State aid for county superintendents and assistant county superintendents should be distributed on the basis of average daily attendance.

5. County boards of education should be permitted to appoint a county superintendent for a period of five years.

6. There is an overlapping of the duties of the county superintendent and the assistant county superintendent in regard to recommending teachers, courses of study, and textbooks. The law should place these duties in the hands of the county superintendent of schools.

7. Some definite standards of educational training and educational experience for the assistant county superintendent of schools should be set up.

8. The present law covering the qualifications of the county school superintendent should be revised and made more specific.

A METHOD FOR THE STUDY OF AZOTOBACTER AND ITS APPLICATION TO FERTILITY PLOT SOILS

Irvin Harold Curie, B.S.,
The College of Wooster, 1923

Department of Soils

The following method has been developed for determining the number of *Azotobacter* colonies in soil.

The medium is composed of fifteen grams of agar, twenty grams of mannite, and two grams of a mixture of mineral salts for each liter. This is heated in an autoclave until the agar is completely dissolved. One hundred cubic centimeter portions of the medium are poured into twenty cm. aluminum Petri dishes and allowed to solidify. One gram of soil particles which pass a twenty-mesh sieve but are retained by a forty-mesh sieve is scattered as uniformly as possible over the surface of the agar. Eight plates are inoculated with each soil to be analyzed. After four days incubation at 28° C. the colonies appearing on the plates are counted.

Factors involved in the application of the method have been studied. It has been found that an incubation period of at least three days is necessary to obtain a significant colony count. By using eight plates for each soil sample the differences between the counts for different plots have been found to be significant in practically all cases. The amount of nitrogen fixed by the *Azotobacter* colonies developing on the plates has been found to be inversely proportional to the logarithm of the number of colonies per plate.

This procedure has been applied to soil samples from the plots of the Five Year Rotation Fertility Experiment at Wooster. The following conclusions appear to be justified by the data obtained:

1. In general, the *Azotobacter* population has been much greater in the limed check plots than in the limed plots receiving fertilizer treatment.

2. Additions of sodium nitrate have been followed by greater growth of *Azotobacter* than additions of either superphosphate or potassium chloride.

3. It has not been possible to show any correlation between the *Azotobacter* population and the crop yield in the check plots.

4. *Azotobacter* colonies have not been found in soils having a pH value less than 6.0.

MEANS AND METHODS OF SECURING HOME PRACTICE WORK IN VOCATIONAL AGRICULTURE IN ADDITION TO THE MAJOR ENTERPRISE

Raymond Lewis Dennison, B.Sc. in Agr.,
West Virginia University, 1924

Department of Agricultural Education

The purpose of this study was to set forth some means and methods of securing more supervised home practice work in courses in vocational agriculture than is usually done by average students. Each state supervisor in the United States and Hawaii was asked to submit a list of his teachers, designating five whom he considered among his best in securing good programs of home practice work. Each supervisor was also asked to contribute any ideas and any literature he might have pertaining to the subject. Forty-six of the forty-nine supervisors replied to this request. In addition to furnishing the list of teachers, many of the state supervisors wrote personal letters setting forth their own ideas on the subject and many contributed pamphlets and other publications.

A questionnaire was prepared and sent to each of the 230 teachers whose names were suggested by the supervisors. Replies were received from 130 of these teachers, which represented 42 states and Hawaii. From these replies information was obtained with reference to the following topics:

1. The status of supervised home practice work in addition to the major enterprise in vocational agriculture.

2. The incentives used to motivate the boy to carry supervised home practice work in addition to the major enterprise.

3. The results obtained from securing home practice work in vocational agriculture in addition to the major enterprise.

From the data and ideas submitted by supervisors and teachers, a survey of the literature in the field and some of our own experience in teaching and supervising work in vocational agriculture, the following means and methods were derived and discussed in their relation to securing a larger range of supervised home practice work than is done by the average boy in a class of vocational agriculture:

1. Increasing requirements
2. Increasing cash income
3. Creating more interest in learning the vocation of farming
4. Planning and teaching every job in view of having some of the students perform it at home
5. Teaching standard practices for every job taught
6. Setting up higher goals
7. Planning supervised practice programs carefully
8. Teaching to coöperate
9. Using score cards
10. Increasing grade or credit
11. Checking results carefully
12. Providing time for the work
13. Allowing in class only boys who have facilities to do the work.

THE HISTORY OF COMPULSORY ATTENDANCE IN OHIO
FROM 1900 TO 1929

Leland Elias DePriest, B.Sc. in Agr.,
The Ohio State University, 1914

Department of School Administration

This study traces the development of compulsory attendance in Ohio by presenting the forces favoring or opposing it and the arguments they presented, and the changes and results of the law enforcing it.

The chief sources of information have been obtained from articles appearing in the Ohio educational magazines, resolutions of state organizations, newspaper and magazine comments on legislation, reports of state commissioners of education, governor's messages, special studies, and session laws and bills of Ohio.

The addresses before, and the resolutions of, the two state educational organizations have probably had the greatest influence toward shaping our compulsory-attendance law during the first two decades of this century; while the work of the Ohio Council on Child Welfare, the Ohio Institute, and other state and national organizations interested in the welfare of children has been foremost during the last ten years.

The summary of the arguments favoring compulsory attendance and more stringent enforcement is: (1) that the community must pay either for the inefficiency of labor or for its training; (2) that it is better to pay for the training in public schools than to pay for the keep and maintenance of individuals in prisons or asylums; (3) that it benefits the individual and the community; (4) that it is the greatest protection to our public institutions; (5) that all must be trained for useful citizenship in a democratic state; (6) that some parents, teachers, principals, superintendents, and employers do not know their obligations to children; (7) that it more nearly equalizes the advantages of the poor

and the rich; (8) that it protects the health of the child; and (9) that it minimizes child labor, unskilled labor, and unemployment.

The arguments opposing are: (1) that the Bing law was put through by those interested in keeping their jobs and in making jobs for others; (2) that it is impossible to compel pupils to receive an education after fourteen years of age; (3) that it means greatly increased expenditure; (4) that it tends to train children in idleness and delinquency; (5) that the chief need of the world is for a great many mediocre people to be trained to be useful and happy; (6) that organized labor wants to keep children out of employment; (7) that keeping children in school beyond the practical age is softhearted sentimentalism; (8) that the compulsory-attendance law was not enforced in counties; and (9) that the compulsory-attendance law was too drastic in respect to the issuing of certificates.

The compulsory-attendance law has been completely rewritten twice during the period (1900-1930); once in 1902 and again in 1921. Only five legislative sessions—those of 1900, 1909, 1911, 1912, and 1915—failed to see the introduction of one or more bills pertaining to compulsory attendance. The two outstanding sessions, 1923, and 1925, had six and seven bills respectively, apparently both to protect and to weaken the 1921 Bing law.

WIND STRESSES IN TALL BUILDING FRAMES

Frank James Dickerson, Jr., B. Arch., B. Arch. E.,
The Ohio State University, 1927, 1929

Department of Civil Engineering

This thesis is a record of the work attempted and accomplished on the second year's research into wind stresses in tall building frames, made possible by The American In-

stitute of Steel Construction under the direction of Professor C. T. Morris of The Ohio State University.

The first year's work dealt primarily with wind pressures, the variation of the pressure over different parts of the building, and the development and construction of the Wind Pressure Device, an instrument to record wind pressure. The second year's work is a continuation of this research and pertains essentially to the sway produced in tall buildings by wind forces, and to the development and construction of the Sway Photot, an instrument for measuring and recording building movement.

This volume is divided into three major parts. The first part deals with the changes and improvements incorporated in the old apparatus. The second part explains the second year's research. Years ago buildings were small and massively built. Being small, low, and strongly constructed, they were not affected noticeably by the wind. But, with the introduction of the tall, modern, steel skyscraper, the exposed areas of building facades have increased enormously and have become the playgrounds of the winds. Being tall and slender, they are subjected to the same motions as grain waving gently in the summer breezes, although to a much lesser degree; still this slight motion in tall buildings may be and is detected by a few people who possess abnormally keen senses of equilibrium, and as this motion more and more increases in magnitude, people begin to detect it. Although a tall modern building may weave in the wind, it may be perfectly safe structurally. It proves a greater problem psychologically than structurally.

The Sway Photot and horizontal pendulum are fashioned after the principle of the earthquake seismograph, the greatest dissimilarity being in the recording apparatus. The main theory is to suspend a point in space and to measure the movement of material objects about this stationary point, such as the earth or a building.

In this research the horizontal pendulum is composed of a small rod placed in a horizontal position, with a heavy mass at the free end, and a cone point at the other end which

bears against a punch mark in a hard metal plate. The mass is held up in place by a wire running diagonally upwards to a point on the wall vertically over the point of contact of the rod and the bearing plate. The theory is that, for small vibrations, the inertia of the mass is great enough to cause the mass to remain stationary during slight quivers or vibrations. Because the motion of the A. I. U. Building is so small, it was feared that by attaching a pen to the pendulum the friction of the pen on paper would cause an appreciable error; it was decided that the motion should be recorded photographically.

The Sway Photor Camera was then designed and constructed. It is composed of a bellows extension camera and a power unit to supply the unexposed sensitized paper and also to wind up the exposed paper. The distances of the light to the lens, and the lens to the paper are so proportioned that the recorded movement is three times the actual motion.

On the pendulum is placed a pin-point source of light; the Sway Photor Camera is placed opposite this minute light. The light then shines through the lens of the camera on to a strip of $2\frac{1}{2}$ " sensitized paper which is in constant motion throughout the duration of the test run, thereby giving a continuous, even, and unbroken record.

The Sway Photor Camera is placed on the floor of the building and moves with the building back and forth in front of the stationary point of light on the mass of the horizontal pendulum. The light, therefore, plots a continuous black wavy line, except for a slight break in the line due to the current to the light being turned off momentarily once every minute, thereby giving a timing device directly on the record.

Because of lack of time and lack of wind storms, only two tests were attempted on the building, one during the experimental stage of development, and the other with the apparatus complete. Although the wind in both tests was mild, a very slight building vibration was detected, proving that even a slight wind produces motion in a tall building and also that the recording instruments were fairly sensitive.

THE DEVELOPMENT OF A COMPULSORY SYSTEM OF EDUCATION FOR OHIO, DOWN TO 1900

James Monette Diley, B.Sc.,
Ohio Northern University, 1909

Department of School Administration

From 1803 to 1835 there was no agitation for compulsory attendance. The voluntary plan was in operation and the only interest manifested by the state during this period was that of providing the means of education. Enrollment and attendance were entirely voluntary with the child or his parents. The state assumed that parental interest in children would insure their attendance in school. Such evidence as could be found for this period indicated that school attendance was very low.

In 1835 evidence of dissatisfaction with school attendance under the voluntary plan was first noted. The proceedings of the Western Literary Institute for that year contained several recommendations that the state should compel the attendance of children, in cases of parental neglect. Calvin Stowe two years later presented before the State Legislature the Prussian plan of compulsory education, and 10,000 copies of this report were printed for free circulation over Ohio. Governor Reuben Wood in 1852 recommended a specific compulsory-education law. Several unsuccessful attempts to provide such a law were made during the next twenty years.

During the period of 1877-1900 a compulsory-attendance system was established. The law of 1877 was poorly drawn and lacked provisions for its enforcement. A more comprehensive law was passed in 1899 and, as amended the next year, remained the compulsory-attendance law for the balance of this period. This law was favorably received and well administered, and gave good results. In its first eight years of operation, daily attendance increased from 64 per cent of the enrollment in 1890 to 74 per cent of the

enrollment in 1898. In the same time the daily attendance increased from 47 per cent of the enumeration to 52 per cent. Ohio, after nearly a century of experiment and controversy, had become firmly committed to the use of a compulsory-education law to insure the education of all the children of all the people of the state.

THE RATE OF ABSORPTION OF SULFUR DIOXIDE

Tod B. Galloway Dixon, B.Ch.E.,
The Ohio State University, 1923

Department of Chemical Engineering

The rate of absorption of sulfur dioxide gas by NaOH solutions was determined. The effect that NaOH itself had on the rate of absorption was also determined.

An apparatus was used in which physical means were used in place of chemical means to measure the rate of absorption. Apparatus consisted of a glass cylinder, with glass agitator, in which the absorption took place. This cylinder was connected to a 1000-cc. graduated cylinder which was also connected to a bottle containing water saturated with sulfur dioxide gas. When the sulfur dioxide gas, in the cylinder, was absorbed by the absorbing liquid, a vacuum was produced in the apparatus which caused the saturated sulfur dioxide water in bottle to flow into the graduated cylinder. The time required for a given volume to flow in was measured and results calculated. Runs were made using 0-2-5-7-10-12-15 per cent NaOH solutions, and with 2-5-10-15 per cent Na_2SO_4 solutions. Effect of NaOH on the rate of absorption of sulfur dioxide gas was calculated.

No equations were found in the literature for the rate of absorption of sulfur dioxide gas by liquids or solutions except for water. The following equations were derived there-

fore from data for the rate of absorption of sulfur dioxide gas by solutions. Equations are for a temperature of 28°C. and a rate of agitation of 345 R.P.M. In the equations, R equals rate of absorption in cc. per second per square centimeter and C equals the percentage of concentration of absorbent by weight.

Rate of absorption of SO_2 by NaOH solution :

$$R = .0069C + .0868$$

Rate of absorption of SO_2 by Na_2SO_4 solution :

$$R = -.0016C + .0868$$

Effect of NaOH on rate of absorption :

$$R = .0085C$$

The thesis also gives complete data, curves, and drawing of apparatus.

A STUDY OF THE COMMUNITY INTERESTS OF PORTAGE COUNTY WITH A VIEW TOWARD LARGER HIGH-SCHOOL CENTERS

Grant Harrison Donaldson, A.B.,
Hiram College, 1922

Department of School Administration

The purpose of this study was to determine the community centers of Portage County as possible high-school centers.

The present conditions of the schools were carefully studied by various reports found in the county office. The study revealed that the county is divided into 24 school districts, which vary in shape and size. The study also revealed a wide range in the amount of wealth per pupil enrolled. The county contains 22 rural high schools with enrollment ranging from 28 to 110, the average enrollment for the county being 61.7. Of these 22 schools, 7 are of

second grade. Circles drawn at 2, 4, and 6 miles radii show a vast amount of overlapping of territory. In addition many of these schools are experiencing financial difficulties.

The study revealed certain facts, namely:

1. Certain townships and villages have declined in population while others have remained stationary over a period of 30 years.

2. Portage County has a preponderance of small high schools, many of which are located in open country.

3. Small communities are components of larger communities.

4. Township lines and county lines are no barriers for trading purposes.

5. School-district lines do not conform to township and county lines.

6. There is very little territory in the county that is not within 6 or 8 miles of a large trading center.

7. Portage County is comparatively level, with many miles of good roads, and is therefore adaptable to larger units.

Therefore it is recommended:

1. That certain territory within the county be transferred to neighboring counties for school purposes.

2. That the two remaining one-room schools in the county be abandoned as soon as road improvement permits of the pupils being transported to the centralized schools in those townships.

3. That no more small high schools be established in the county.

4. That small second-grade high schools, located within easy reach of larger high schools, be reduced to junior high schools as soon as proper adjustments can be made for grades 10 and 11 in these schools.

5. That the senior high schools of the county be located at Garretttsville, Mantua, Ravenna, Kent, Atwater, and Mogadore.

6. That, as economic necessity compels a readjustment into larger units, the county board establish the school-district lines in accordance with the general outline of boundaries in compliance with the community centers as indicated in Map XV, page 59.

THE EXTENT TO WHICH PUPILS IN THE LARGE HIGH SCHOOLS
OF WEST VIRGINIA ARE BEING TAUGHT BY TEACHERS
WHO ARE PREPARED TO TEACH THE SUBJECT

Lyell Vernon Douthat, A.B.,
Marshall College, 1926

Department of School Administration

The study is in the nature of a survey, and a questionnaire was used. The study field was limited to the high schools of West Virginia having a staff of eleven or more, including the principal.

Thirty-six schools and five hundred teachers and principals were included. The number of pupils who were taught various subjects during the semester involved amounted to a total of 48,283.

The training of the teachers and principals is considered from the point of view of schools attended, degrees held, certificates acquired, and professional subjects taken.

The experience of teachers is considered in the light of total experience in certain types of schools and experience in the teaching of certain subjects for which they are variously prepared. Experience is also considered in respect to its relation to the teachers' opinion of certain professional subjects.

Teacher load in terms of preparations per day and sizes

of classes in the subject fields is discussed. Teachers' choice of teaching field is compared with the training in the fields held by them.

The number of pupils in the subject fields, being taught by teachers who have majors, minors, seven or more hours of credit, or fewer than seven hours credit in the field, is found. The cost of teaching these pupils for a year in the subject is also discovered. The cost per class of instruction by variously prepared teachers and the total cost of instruction is found.

A rather extensive bibliography accompanies the study.

A brief statement of findings follows:

By the 500 persons considered, 229 schools above the high-school level were attended, and from 137 of these schools, degrees were received.

NUMBER OF TEACHERS TEACHING SUBJECTS IN WHICH THEY
HAD CERTAIN TRAINING

	Major	Minor	Major and minor	Major or minor and odd	Odd
Number	204	65	104	66	31
Per cent	43.4	13.9	22.1	14.1	6.6

NUMBER AND PER CENT OF PUPILS BEING TAUGHT BY TEACHERS
VARIOUSLY PREPARED. COST PER CLASS, COST PER PUPIL
AND TOTAL COST OF SUCH INSTRUCTION

	Majors	Minors	Seven or more hours credit	Fewer than seven hours credit
Number of pupils..	28,731	15,351	2,516	1,685
Per cent of pupils..	59.6	31.8	5.2	3.4
Cost per class.....	\$ 360.29	\$ 343.16	\$ 349.09	\$ 261.77
Cost per pupil, per year	16.60	14.68	14.84	13.04
Total cost	\$477,030	\$225,459	\$ 37,353	\$ 21,989

Read this table as follows: 28,731 pupils were being taught by teachers who had majored in the subject, 15,351 by teachers who had minored in the subject, 2,516 by teachers who had seven or more hours credit in the field, and 1,685 by teachers who had fewer than seven hours college credit in the subject.

The subjects listed in order of helpfulness were psychology, education (unclassified), methods of teaching, practice of teaching, educational sociology, principles of teaching, tests and measurements; public speaking (not strictly classed as a professional subject) ranked very high in the list.

As to total teaching experience, the first quartile was 1.22 school years, the median was 2.94, and the third quartile was 5.88.

The correlation coefficient representing the degree of relationship existing between salary and experience was, in the case of men teachers $+.5$; in the case of women teachers $+.59$; and in the case of principals $+.61$.

The total range of subjects taught by the teachers, including the schedule of the semester considered, was from 1 to 9 inclusive. The first quartile was 1.11, the median 1.93, and the third quartile 3.07.

The first quartile, in the case of preparations per day, was 1.30, the median 2.09, and the third quartile 3.09.

The average size of classes was twenty-two.

CONSOLIDATION OF PRESENT ONE-ROOM SCHOOL DISTRICTS OF HANCOCK COUNTY, OHIO

Thomas Ireland Duncan, B.A.,
The University of Michigan, 1924

Department of School Administration

The problem is the consolidation of the present one-room school districts in Hancock County with existing centralized school districts. The proximity of these one-room school districts to existing centralized school districts within and without the county made it imperative that a careful study be made to answer the question of whether they should centralize their own schools or attach themselves to districts already centralized.

Both primary and secondary sources of information have been used in the present study. Information of a primary nature has been gathered by questionnaires which were distributed over the areas concerned in the study. To supplement the questionnaires, personal visits were made to many homes located in the rural-school districts. Questionnaires and personal interviews help very much to determine lines of community interests which, in turn, are valuable criteria in the location of future consolidated school-district boundaries. Sources of secondary information related to the study are surveys of similar nature made in this state, works of authorities on the problems of rural life, periodical literature dealing with rural-school problems, and the reports of public officials of Hancock County.

In substance, this study is intended to show the following facts:

1. The county is well supplied with first-grade high and elementary schools.

2. County and township lines should not be a barrier to consolidation of schools. Much duplication of educational effort occurs as a result at the present time.

3. Hancock County, due to its high percentage of good roads, its flat topography, its sparse and slowly decreasing population, its moderate climate, and its limited wealth, is naturally favorable for large school units.

In accordance with these conclusions, recommendations are made. The county unit should be established for the administration and supervision of the schools of Hancock County. Such a unit would make more nearly possible the carrying out of the remaining recommendations, which include in detail the plan for the consolidation of all of the present one-room school districts with existing centralized school districts within and without Hancock County.

THE PERMEABILITY OF IRON AT HIGH FREQUENCIES

Donald William Dunipace, B.A.,
The Ohio State University, 1929

Department of Physics

The disagreement of results of previous experimenters suggests further study of the variation of permeability of iron wires with the frequency. G. R. Wait¹ was able to detect no critical change, within the limits of accuracy, at 100 meters wave length, as had been observed by Wwedensky and Theodortschik². Wait also concludes that the permeability as determined by each coil must be multiplied by a correction factor to agree. The method used in the present work is the heterodyne beat method used by M. H. Belz.³ It consists essentially in noting the effect produced in an oscillator by placing a magnetic specimen in its inductance coil. The effect is observed by a tendency toward change in the beat frequency between this oscillator and a reference oscillator. Our results indicate that the permeability of iron decreases as the wave length decreases, in contrast to the results of Wait which indicate an increase in permeability as the wave length decreases. The results obtained from the use of different coils seem to agree, and this agreement apparently has not been accomplished by previous investigators. We observed a small fluctuation at about 450 meters wave length, but we felt unable to prove or disprove either of the former views concerning this irregularity, without further investigation. It might be suggested that resonance within the specimen coil, between its inductance and the capacity between turns, could easily cause irregularities; for the wave length of such oscillations would likely differ from those of the main circuit, and the current would likely be greater.

¹ Abstract 1972 (1929).

² Abstract 763 (1923).

³ *Phil Mag.*, XLIV, 479 (1922).

THE EXTENT TO WHICH PUPILS OF JUNIOR- AND SENIOR-HIGH-SCHOOL AGE FULFILL THE REQUIREMENTS OF THE "BING LAW" IN SENECA COUNTY

Bernard Marcellus Durbin, B.Sc. in Agr.,
The Ohio State University, 1920

Department of School Administration

One who has been so situated or engaged in educational work as to have come into contact with the youth of today cannot help being impressed with the fact that some children are prematurely leaving school and taking their place in the field of industry.

I became interested in the problem of finding out the number of boys and girls of junior- and senior-high-school age in Seneca County who are leaving school and going to work; whether or not these boys and girls are leaving school in compliance with the Bing Compulsory-Education and Child-Labor Law; whether or not the pupils, if attending school, are fulfilling the requirements of the law in regard to limited absence, compulsory age limit, and working or part-time certificate when absent; and whether or not the Bing Law is enforced, and enforced in the right manner, by the attendance officers and the courts.

The Bing Law has been in operation since 1921 and contains many high standards. The purpose of the law was not to keep all children in school until 18 years of age, but to give adequate protection to those who leave school at the age of 16 to go to work.

This study included 3,759 boys and girls living in the confines of Seneca County or in Seneca County School district, who had reached their twelfth birthdays by September 1, 1928, and who had not yet reached their eighteenth birthdays by September 1, 1928.

The primary sources for securing the information needed in this study were the school census and the school enrollment. When these sources did not contain all the informa-

tion needed in this work, the superintendents, principals, and teachers were consulted; sometimes the parents and the members of the child's family. Neighbors and employers gave information. In many cases the attendance departments were helpful in giving data concerning children who did or did not have a working permit.

Conclusions:

The schools of Seneca County, including those in cities in the county, have no record system at the present time from which to secure data of this kind. Approximately only 83.6 per cent of all pupils were in school during the entire school year, 1928-29. Of the 83.6 per cent, approximately 34 per cent missed more than six days or one week of school; 9.4 per cent missed more than fifteen days, the standard set in the Bing Law as the number of days of excused absence. Approximately 5 per cent of all pupils studied withdrew during the year. Twenty-five per cent withdrew while in the ninth grade and 23.6 per cent while in the seventh grade. Thirty-three per cent of those withdrawing secured a working certificate. Of those who did not secure a working permit, 51 per cent were engaged in farm work, 28 per cent in housework, and 20 per cent did miscellaneous jobs. Approximately 6 per cent of all pupils studied were not in school and did not have a working certificate. Yet records said they were working at home. Attendance officers have not been willing to coöperate with school officials in enforcing the Bing Law. The Probate Judge has not been in full harmony with the requirements of the Bing Law. Pupils in rural districts have not secured working permits to work upon the farm and in the homes.

Recommendations Made:

A continuous census system should be established, one that will be up-to-date at any time, in fact, at all times. It should be kept in such a manner that it can be easily checked with the school enrollment. A card system should be used. This might consist of cards upon which all the names of the members of one family are filed in complete detail, or of an individual card for each child. In either case, after the

census is completed, these cards can be arranged systematically. A program creating an incentive for regular attendance is needed. The county must be shown that it is not doing the right thing for its children if it dodges the requirements of the Bing Law. All pupils should be required to have a working certificate, even though they do work on the farm or in the home. There should be a more efficient attendance department, more accurate and complete records kept in the department, and more promptness in checking attendance. The attendance officer should be socially trained. The public should be educated as to the advantages of good schools and a good education.

INSECTS IN ENGLISH POETRY

Pearl Faulkner Eddy, A.B.,
Meredith College, 1925

Department of English

The object of this thesis is to give some conception of the variety and number of insects that occur in English poetry, and to show their amazing adaptability to the expression of infinitely varied ideas.

From remote antiquity man has regarded the insect as a means of torment to effect retribution on the erring individual or nation. Events of such cataclysmic proportions as plagues inevitably recur in literature. Biblical accounts of plagues are reflected in such masterpieces as *Paradise Lost*.

Because of their small size, insects become an effective source of belittling epithets and an impressive means of describing distant or unimportant objects. Minuteness, however, is not always correlated with insignificance, but often serves as an entrée to the society of the fairies.

When the poet turns artist, he enhances the beauty of his

sunny landscapes by picturing insects of brilliant hue, or accentuates the dismal tone of a gloomy scene by depicting those of neutral shades. When the harmony of color and the poetry of motion unite in the graceful body of a colorful insect, the poet is entranced.

Just as the insect song harmonizes with any chorus of nature, so, as does music at the theatre, it interprets the mood or heightens the effect of any drama.

The courtship of insects and flowers has intrigued the imagination of the poet. Insects, so charming in their own courtships, fly to the assistance of the poet in his affairs of the heart, serving as messengers to his beloved and supplying him with "honied" terms of endearment.

Though the poet satirizes some of his fellow artists and their style by comparing them to certain insects, he shows a fond predilection for picturing himself and the poets he admires as other insects. The poet, his methods, and his works are either disparaged or complimented by insect analogies.

Throughout the ages the voice of the reformer has reiterated Solomon's admonition to go to the insect for wisdom. Many lessons derived from the insect have become a part of the general knowledge of the people, who have learned them as proverbs to govern their conduct.

By insect analogy, the poet strikingly describes almost any object or person, situation or idea.

Insects are chameleons changing their color to blend with the tones of the poet's mood. Insects which are exactly alike will be exalted by one poet, denounced by another, and even the same poet will characterize the same insect at one time as vile and at another as devine, according to the mood of the moment.

From time immemorial the insect has awakened in man the most profound thoughts of which he is capable, thoughts of life and its meaning, of the universe and its mystery.

Insects as religious, political, military, and provincial symbols occur in many types of literature.

THE CHARACTERISTICS OF TYPICAL SOUND SOURCES AS SHOWN BY THE LOW AUDIOMETER

Charles Flavius Edwards, B.A.,
The Ohio State University, 1929

Department of Physics

The Low Audiometer is a sensitive optical kymograph designed to record the pressure variations in a sound wave. The experiments described show in a general way its usefulness in complex sound-wave analysis by a study of the wave forms obtained for some typical sound sources.

The vibrating system of the audiometer consists of a light, thin diaphragm having a small mirror silvered directly on it. A narrow beam of light reflected from the mirror traces out the wave form on a moving photographic film. This method of recording is entirely free from distorting effects, except those due to the horn and diaphragm itself.

Records were obtained of a variety of sources including flute organ pipes, the clarinet, the violin, and the cornet. Records of the eight vowel sounds and the spoken word "audiometer" were also made. The results obtained show that the diaphragm is capable of responding to very complex sound waves and to rapid changes in the quality of the sound.

The sounds studied range in frequency from 150 to 1200 cycles. Frequencies were determined with an accuracy of four figures, using an electrically driven tuning fork as a standard. The intensity of the sound required was found to be quite large, ordinary conversational loudness being insufficient, for example, in obtaining records of the vowel sounds. A method for obtaining visual wave forms is also described. The resonant frequencies of the horn and diaphragm were determined approximately. Using a low frequency oscillator and dynamic speaker as a source, it was found that the diaphragm responds to all frequencies between 100 and 4000 cycles.

A STUDY IN METHODS OF COLLEGE TEACHING

Amos R. Eikenberry, B.S.,
The University of Illinois, 1920

Department of Psychology

Procedure:

One of three sections in a class of sophomores in general psychology was used as an experimental group. The two other sections served as controls. In the control sections the "conventional" methods, including discussion, reports, and so forth, were used. In the experimental section the students used an hour each day for supervised study. During this hour the instructor gave informal suggestions, asked questions of individuals or of groups, and gave aid only when necessary. These students handed in written reports on sets of problems and questions that had been handed to them on mimeographed sheets. The regular class hour was made as informal as possible, and group activity was encouraged. A sliding scale of credit, varying from three to five hours, was arranged to care for individual differences. Students were encouraged to read and report on books of an interesting and non-technical nature, in addition to their regular outside work.

Results:

Summaries of extra reading were handed in covering a total of nearly eighteen thousand pages of material. This amount of reading was done by twenty-seven students. Objective tests, including approximately five hundred questions, were given at various times during the eighteen weeks in which the experiment was in progress. Comparisons were made between the three sections as such and also between paired groups, which were paired on the basis of two intelligence tests. With but one exception the experimental group did better work on the tests than any of the control groups, though the difference was not great. Student evaluation showed a marked preference for this method over the conventional method in other courses.

Most students liked the informality and the greater opportunity to use their own initiative. Many spoke favorably of the problems because of their specific nature.

Comparisons were also made in the class in educational psychology during the following term. Students from the experimental section were paired with others. The results were consistently in favor of the experimental group.

Judging from the results, the indications are favorable to the method. The consistency of the results is perhaps more significant than the size of the difference. The superiority of the method is indicated to be more pronounced for the more intelligent students.

A COMPARISON OF DELINQUENT BOYS AND NON-DELINQUENT BOYS WITH REFERENCE TO BIBLICAL KNOWLEDGE, RELIGIOUS TRAINING, ECONOMIC AND SOCIAL STATUS

Royal Burdick Embree, Jr., B.A.,
Washington and Lee University, 1929

Department of Psychology

In attempting to understand delinquency, it is necessary that one understand the effect of various types of environment on children. This study was undertaken in an effort to determine differences between delinquents and non-delinquents with regard to economic and social status, moral and social attitudes, religious attitudes, Biblical knowledge, and religious training.

A test battery covering these factors, with the addition of an intelligence scale, was prepared and administered to a group of delinquent boys and to a group of non-delinquent boys. The delinquents were chosen from the Boys' Industrial School in Lancaster, Ohio, while the non-delinquents were secured from various public-school systems throughout the state and in North Manchester and Manchester, Indiana.

The methods followed in this study were those of general comparison, in which case use was made of all members of each group, and of comparison by matched groups, in which case delinquents were paired off and matched with regard to intelligence and economic status. In addition to these comparisons, the correlation between intelligence and the other tests was brought into consideration.

The conclusions derived from the study may be briefly stated as follows:

1. The non-delinquent group was intellectually superior to the delinquent group.
2. The delinquent group was superior in economic status, but inferior in social status.
3. The non-delinquent group showed a definite superiority with reference to moral and social attitudes.
4. There is little difference between the groups as far as religious attitudes are concerned.
5. The non-delinquent group proved superior with regard to Biblical knowledge.
6. The delinquents had partaken of more experiences of a religious nature than had the non-delinquents.

ORGAN MUSIC AND THE ROMANTIC COMPOSERS

Elmer Frederick Ende, B. of Mus.,
American Conservatory of Music, 1915

Department of Music

The problem of this thesis is first approached from an estimate of the organ as an instrument in the Romantic Period; its merits and demerits as a physical medium of expression are evaluated in comparison with other contemporary mediums.

Next the ten outstanding composers identified with the Romantic Movement in music are studied; their personal musical endowments and environments are set forth, whether or not they are propitious to the composition of organ music. A critical estimate of the organ music written during the period is attempted, and emphasis is laid on this approach to the problem. Mendelssohn, Schumann, Liszt, Franck, and Brahms contributed to the literature of the organ. Beethoven, Schubert, Weber, Chopin, and Berlioz did not. The influence, if any, of each composer on the organ tradition is interpreted.

A résumé is given of the revolutionary influences on music making for the tendencies commonly designated as "romantic":

1. The French Revolution
2. The struggle for social and economic independence
3. The continued secularization of the channels of culture formerly monopolized by the church
4. The intimate relationship of literature with music
5. The awakened interest in the historic culture and folk lore of European peoples
6. The interest in nature

Finally, the tendencies of romanticism in music are reviewed. The comparatively inferior and unequal quality of organ music, after all, goes back to the culmination of the secularization of music and the death of the choral idiom. Sacred music declined. Also, composers shared with the public certain ideas of propriety with respect to the organ; the time-honored tradition of the instrument, confining it to its restricted place in the church, was maintained to a great degree and only gradually passed away as the century wore on. The organ remained the greatest instrument as a vehicle for the polyphonic style; but, since the tendency of the nineteenth century continued in the further evolution of the homophonic style at the expense of the polyphonic, the shortcomings of the organ in comparison with other me-

diums of expression multiplied rather than diminished. It is concluded that the Romantic Period was unfavorable to the creation of organ literature supremely and intrinsically great as music.

In this thesis the word "romantic" is always used with the reservation that the term is not an absolute distinguishing mark of anything; the universal indebtedness of one age to another makes the difference between "classical" and "romantic" only a convenient distinction.

HISTORY OF CHAMPAIGN COUNTY, OHIO, TO 1860

Cecil Roscoe Enoch, A.B.,
Wittenberg College, 1924

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The settlement of Champaign County began after the Treaty of Greenville in 1795, and its organization took place in 1805 by an act of the Ohio Legislature. Urbana, the county seat, became the base for military operations in the War of 1812, due to its position in the path of the armies pushing northward.

A study of the life of the times shows that, with all their hardships and perils, the people found time to be gay. Their amusements were simple, but seemed to suffice in making their hard lot more endurable.

As settlement advanced more and more rapidly, agricultural crops were produced faster than they could be consumed, and the problem of surplus crops had to be dealt with. The demand for improved transportation was met by canals and by railroads, which in turn encouraged other industries and brought many men interested in manufacturing to the county seat, Urbana.

Furniture factories, iron foundries, carriage and wagon factories, tanneries, saw-mills, and grist-mills sprang up and firmly established themselves. Most of them existed

until long after the close of the period covered by this thesis.

Before 1840 there was not much party spirit manifested in politics. Then came the Log Cabin and Hard Cider Campaign, and the visit of William H. Harrison to Urbana. From that time on, there was a great deal of interest in politics. The Whigs were most numerous, but the Locofocos succeeded in making elections interesting. With the annihilation of the Whig and Locofoco parties, the Republicans came to dominate.

Education of the children was not neglected. Every township had its subscription schools, which lasted until 1826, when taxation for school purposes was introduced. After 1753 there was rapid progress in public education in Champaign County.

THE INFLUENCE OF STRINDBERG ON EUGENE O'NEILL

Lydia Jeane Ewing, B.A.,
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Dramatic critics have frequently stated that Eugene O'Neill has been influenced as a dramatist by August Strindberg. O'Neill, himself, in a tribute paid to the Swedish dramatist at the time of the opening of the Provincetown Playhouse, seems to acknowledge indebtedness to Strindberg.

The purpose of this study is to determine whether any basis for this attributed influence can be found in the plays of O'Neill.

In reading O'Neill's plays after a study of the characteristics of Strindberg as revealed by representative plays, many similarities in the works of the two dramatists are found.

Both playwrights show a grim pessimistic outlook on life, particularly in their early plays. There is a common tendency to portray marriage as a cosmic struggle of alter-

nate love and hate, and to portray the "seamy side of life" and abnormalities of character. Both dramatists aim to give a realistic portrayal of emotions, feelings, and eternal forces, often distorting the external reality of the picture for a more vivid presentation of subjective elements. There is a marked trend in the plays of both writers toward mysticism and the projection of their own souls' struggles to understand the mysteries of life. They show similar tendencies in the poetic and imaginative quality of language and in the use of symbolism, music, and the monologue. Each dramatist indicates a freedom and independence in form, adopting in each case what he conceives to be the best form for the subject, without regard for the conventions of the theater.

Since these marked similarities are found, since no other dramatist shows a similar combination of characteristics, and since O'Neill by his own words implies indebtedness to Strindberg, it is concluded that Strindberg has had a marked influence on both the form and content of O'Neill's plays.

It is believed that this influence has been of particular value to O'Neill in leading him away from the sterility of the old school of naturalism into a new freedom where he attempts a deeper understanding of the world in which we live.

THE RELATION OF THE POLICE POWER OF THE STATES TO THE
COMMERCIAL POWER OF CONGRESS AS REVIEWED
BY THE SUPREME COURT, 1824-1852

Clyde Emerson Fenchter, A.B.,
Baldwin-Wallace College, 1927

Department of History

A study of Chief Justice Marshall's opinions in the cases of Gibbons vs. Ogden, Brown vs. Maryland, and Willson vs.

The Blackbird Creek Marsh Company shows that he believed the Federal Government had the exclusive power of regulating commerce. He also believed that the State could pass acts of a nature similar to those passed by Congress, but based on a power different from the one used by Congress, namely the police power.

Beginning with this idea of the relationship of the police power of the State and the commerce power of Congress, the justices of the Court gradually developed a different conception of the police power from that held by Marshall.

The first stage in this development was the enlargement of the conception of the police power. The case of *New York vs. Miln* was largely instrumental in this, although several of the justices accomplished this in the next group of cases usually designated as the License Tax Cases. In the License Tax Cases and the two cases given the designation of Passenger Cases, most of the change in the conception took place. At this period of development the phrase "police power" took on a meaning so broad that it could easily be confused with a concurrent power to regulate commerce; in fact, several of the justices in these cases based the State's power to regulate commercial matters upon both the police power and a concurrent power to regulate commerce. Three justices held that State power to regulate the matters was based on a concurrent power to regulate commerce.

In these same cases Justice Woodbury had declared that some commercial matters, being national in scope, could be best regulated by Congress; while others, being local, could more easily be regulated by the State. But he inserted the warning that State regulations must be based upon the police power and not upon a concurrent power to regulate commerce.

The final stage of development was the interpretation of Justice Benjamin R. Curtis, who appropriated Justice Woodbury's division of matters to be regulated into matters local and national in their effect. But Curtis, unlike the latter, held that the State's power to regulate local matters was based upon a concurrent power of regulating commerce.

The entire development from Marshall's idea of the relation of the police power of the State to the commercial power of Congress, to Curtis' doctrine which based all action upon a concurrent power to regulate commerce, took place in the changing conception of the police power. None of the justices were conscious of the progress that was being made, and Justice Curtis had merely taken the next natural step in the development.

Another fact to be noticed is that under Marshall the effect of each case had first to be determined. It was often a difficult matter to decide as to whether the effect of the regulation was only within the boundary of the State or whether the act regulated interstate and foreign commerce. By the interpretation of Curtis the only fact that had to be ascertained was whether the effect of the act was to be local or national in scope, local matters to be regulated by the State, national ones by Congress.

A CHRONOLOGICAL STUDY OF CHILDREN'S BOOKS IN ENGLAND UP TO 1850

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Ohio Wesleyan University, 1906, 1916

Department of English

In this study of children's books I have attempted to trace the history and development of children's books in England from Anglo-Saxon times to the middle of the nineteenth century, the beginning of the modern era in children's books.

From the Anglo-Saxon period until the middle of the eighteenth century practically all books produced for children were books of instruction, including instruction in behavior and religion.

In 1744 John Newberry, the first person to make a business of publishing children's books, began to issue hundreds

of little books for children, intended primarily for amusement and entertainment, although not wholly lacking in instruction. Many of these he wrote himself, but it is almost certain that others were written by distinguished men of letters, who were his friends.

The influence of Rousseau brought forth the moral tales of Maria Edgeworth, Thomas Day, and others. Miss Edgeworth's tales were the first stories for children to have a well-defined plot and fine characterizations of adults and children.

The middle of the nineteenth century saw children's books occupying a place in English literature, and such distinguished writers as Kingsley, Ruskin, and Thackeray writing stories for children and acknowledging their authorship.

The didactic poem of Isaac Watts, the highly imaginative poems of William Blake, and the moral poems of Ann and Jane Taylor I have discussed in the periods to which they belong.

I have added a chronological list, with dates of publication and names of authors, of all the books I have mentioned or discussed in this thesis.

THE ORIGIN, DEVELOPMENT, AND CORRELATION OF VICTOR HUGO'S POLITICAL AND SOCIOLOGICAL IDEAS BEFORE 1852

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Detailed research on Hugo's political opinions has heretofore begun with either the *Ode à la colonne* (1827) or the July Revolution, passing lightly over the beliefs of his early years or intermingling them with other facts of his youth. Hugo's sociological ideas expressed before the beginning of

his political career have scarcely been touched upon. The purpose of this study is to show the origin, development, and correlation of his views on politics and society before 1852.

Hugo varied in his political allegiances during the first half of his life, being a royalist until 1827, becoming an ardent Bonapartist by 1830, being an independent liberal from 1830 until 1837, and an Orleanist from 1837 until 1848. He served as a conservative representative to first the Constituent, then the Legislative Assembly, but separated from the conservatives in October, 1849, and became a radical republican. Thereafter he aspired to the presidency of France but was thwarted by the "coup d'état" of 1851, which he and other deputies tried unsuccessfully to prevent.

Throughout this entire period Hugo evinced respect for parenthood and the family, and deep love for children. He revered the virtuous woman but from youth pitied the fallen one, and from 1830 on, intermingled the two sentiments. He condemned formal education but finally commended the educator. Hugo urged the preservation of France's national architecture. He criticized the clergy and the church until 1841, but later paid them some glowing tributes. After 1830 he stressed the importance of the theater and the press as social institutions. Beginning with 1829 he opposed the death penalty. He was early aware of the needs of the masses but suggested only charity as a remedy until 1832, thereafter advocating employment, education, and religion, and frequently championing the cause of the lower classes.

The influence of Hugo's sociological ideas on his political opinions first became apparent in 1832 in his treatment of capital punishment, and then gradually increased, becoming very evident after 1845, particularly in his speeches in the Legislative Assembly. His liberal views on society were mainly responsible for his break with the "droite" and for the opinions he expressed on many political questions.

Hugo's political and sociological views, which echoed the

ideas of his time, were determined chiefly by his poetic bent. His conservatism manifested itself in most of his political alliances and opinions on forms of government; his liberalism, in his attitude toward sociological and socio-political questions.

A PLAN FOR STUDYING A LOCAL CHURCH

Byron Lester Fox, B.A., B.Sc. in Edu.,
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The purpose of this study is to present a plan for studying a certain local church in something approaching a scientific manner. (The term "church" is here used to refer to a local church, unless otherwise stated.) Not much has been done in this direction, as most of the socio-religious studies simply include the church as one factor in the community. There is an urgent need for churches to evaluate their work in order to find their actual accomplishment. Instead of this, many churches simply drift along, using superficial judgments of prejudiced leaders to prove that they are making satisfactory progress.

The best plan seems to be to secure data about the church in two ways. First, data can be secured by describing all church organizations and activities. (These terms are used in a broad sense to include all the functionings of the church.) The topics to be considered are the following: (1) a preliminary study—a reconnaissance of current activities and a brief account of the history of the church; (2) basic factors—members and constituents, parish and geographical relations with the constituency; and (3) aspects of the church in action—number of people reached, public services, subsidiary organizations and activities, relations to the world about the church, leadership of the church,

plant and equipment, finances, methods of conservation of members and growth, current church life.

The second phase to be studied is the reciprocal interaction between the activities of the church mentioned above and the individual constituents. The best way of approaching this seems to be by means of a questionnaire. Information on the following points will be sought: (1) the background of the individual—what the church has to work with; (2) the beliefs, attitudes, and opinions of the individual in regard to the activities of the church; and (3) the participation of the individual in the world of the church. These three lines of information can be correlated in order to learn whether there are any causal relationships existing between them.

The data secured are summarized in terms of the adaptation of the church to its situation, giving a reasoned statement of its practical success. In addition to the scientific conclusions, the data can be used by the church leaders in a practical way to determine the future policy of the church.

A trial was made of the questionnaire on a group of 113 constituents of the church in question. An analysis of the results seems to show that the method is practical.

A STUDY OF FIFTY-FOUR FAMILIES IN WHICH BOTH PARENTS
WERE LIVING AND THE CHILDREN WERE PLACED
UNDER THE CARE OF THE FRANKLIN
COUNTY CHILDREN'S HOME

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Department of Sociology

This study is an attempt to show the factors present in fifty-four Franklin County families, in which the one hundred and thirty-two children involved were removed from

their homes and were placed in the Franklin County Children's Home. The period of time used was the fiscal year of 1929 for the Franklin County Children's Home. Children are placed in the Children's Home through the commitment of the Juvenile Court. The Children's Home and the Juvenile Court have a very close working relationship. They are both public agencies created by statute.

In these fifty-four cases, the Court gave as the legal causes for the placement of children away from their parents, desertion, illegitimacy, non-support, incarceration of one parent, mental or physical disability, separation or divorce of parents, abandonment, and improper surroundings. There are, however, fundamental factors present in every case that are learned through contact with the family. Poverty is a very important factor in many cases of family disorganization, and in the majority of others it is present. Incompatibility, sex immorality, disparity of ages, drunkenness, violence of temper, and jealousy were found to be present in some of the cases.

These factors in family discord and family disorganization have a very serious effect upon the child. If the home life of the child is unpleasant and his physical environment improper, it is improbable that his development will be normal. The opinion of authorities is that the best home for the child is the home of its parents. Is sufficient effort made to aid the parents in maintaining a suitable home for the

TABLE I
SHOWING THE AGENCIES THAT HAVE CONTACTED
THE FAMILIES¹

Name of Agency	Number of Families Contacted
Children's agencies	25
Family agencies	75
Red Cross	9
Columbus Division of Charities.....	19
Juvenile Court	15
Family Service	13
Health agencies	61
Religious agencies	10

¹ For complete table, see Table XXIX, Chapter VI, of thesis.

child? It is discovered that many agencies have established contacts with the families.

It is important that nine of these families have been rehabilitated and are now managing quite well. Could not the family have been aided without removing the children?

As a result, only one or two conclusions can be reached, and a few suggestions made. It is essential for the agency working with the case to have all the available and obtainable information concerning the family, and it would be well to have case conferences where family disorganization is considered. It is suggested that a study made of this classification of cases over a period of years, with all the material needed for interpretation, would be of value to the community.

EFFECT OF CATALYSTS ON THE ALUMINUM-COPPER SULFATE REACTION

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It has been known for some time that there is very little reaction between metallic aluminum and aqueous solutions of cupric sulfate, although aluminum should displace copper from solutions of this salt according to the electrochemical series. Chlorides have been found to accelerate the reaction. The chloride catalyzed reaction may be stopped by the addition of a sufficiently large quantity of an oxidizing agent.

In this investigation a quantitative study was made of the reaction between metallic aluminum and aqueous solutions of copper sulfate, both in the presence and in the absence of secondary substances.

Experiments were carried out using various concentrations of chloride in order to determine whether or not there

was a concentration of chloride which would cause a maximum rate of reaction. The aluminum for some of the experiments was treated several ways to find if the condition of the surface of the aluminum had any effect on the rate of the reaction. Equivalent amounts of different chlorides were used to find their relative effect as catalysts for the reaction. The concentration of the copper sulfate solution was varied to find the relation between its concentration and the rate of the reaction. The amount of potassium dichromate necessary to stop the reaction after it had been started by the addition of a chloride was determined, using two different concentrations of copper sulfate solution and carrying out the reactions at two temperatures.

A discussion of the results is given along with a discussion of some possible explanations of (*a*) the passivity of metallic aluminum towards aqueous solutions of copper sulfate, and (*b*) the mechanism by which chlorides catalyze the reaction.

The results may be briefly summarized as follows:

1. Of the catalysts used, chlorides were the most effective, with perhaps bromides and iodides almost as good.
2. There is a concentration of chloride which gives a maximum rate of reaction.
3. The condition of the surface of the aluminum appears to have no effect on the rate of the reaction.
4. All other things being equal, the rate of the reaction is proportional to the concentration of the copper sulfate solution, the action being more rapid in concentrated solutions than in dilute.
5. All other things being equal, the amount of an oxidizing agent necessary to stop the reaction is greater (*a*) in concentrated solutions of copper sulfate than in dilute, and (*b*) at higher temperatures than at lower ones.

REDISTRICTING OF THE HIGH SCHOOLS OF AUGLAIZE COUNTY, OHIO

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The purpose of this survey was to determine whether there are any weaknesses in the present school districting of Auglaize County and to establish basic facts for determining more logical and more efficient school districts.

Questionnaires were used to secure the necessary data for this investigation. The questionnaires were made up of such interests as church, lodge, merchandise, grocery, school, and so forth, which would usually be accepted as a basis for determining community centers.

Questionnaires were delivered to each school in the county, and were filled out in school, under the supervision of the teachers, by the older pupils. One was filled out for each family represented in the county schools. The returns of the questionnaires were exceptionally good, evidenced by the fact that 96.6 per cent of the schools returned questionnaires.

These data from the questionnaires have been tabulated. Graphs, charts, tables, and maps were constructed and interpreted, and make up a large part of the body of this thesis. From these data great inequalities were found to exist in wealth per enumerated pupil and tax rate for school purposes. It was also found that 71 per cent of the high schools have an enrollment of ninety-nine or less, and that in four sections of the county, pupils were within four miles of four different high schools, showing that the high schools are too close together.

A summation map was constructed to show the points to which people are naturally drawn from all parts of the county. This map shows four well-defined community centers. Using this map as a basis, together with such facts as

per cent of good roads, modern method of transportation, small enrollment and proximity of high schools, small bonded indebtedness, and the conditions of the present school buildings, equipment, and playgrounds, the following recommendations were made:

1. That more logical and efficient school districts be established.

2. That there be four large junior-senior high schools established in the county.

3. That the elementary grades be consolidated at the same points as the senior high schools are at present.

4. That the office of the county superintendent be abolished, thus making the local superintendent and board of education directly responsible to the State Department of Education.

Suggestions were made for continuing this study on such problems as: present school bonded indebtedness, building program, and distribution of pupils and transportation.

VOCATIONAL SURVEY FOR SLOAN INDUSTRIAL SCHOOL BELLEFONTAINE, OHIO

Philip Quillman Freeman, B.S.,
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Department of School Administration

The problem of the thesis was created by the Will of Dr. Earl Sloan, originator of the well-known "Sloan Liniment." The Will provided for the establishment and maintenance of an industrial school "for teaching trades, and mechanical and domestic science to boys and girls," in Bellefontaine, Ohio, a city of approximately 10,000 population. Provision was made to endow the school separately or in conjunction with the public high school of the city, as seemed most desirable to the trustees. Three trustees were named, and pro-

vision made for making the board self-perpetuating. The amount accruing to the trustees was placed between one-half and three-fourths of a million dollars.

Bellefontaine industries are limited to the railroad employing about 350 men in its shops, a brass plumbing supply factory employing approximately 100 men, a hearse body works employing approximately 135 men, and a bridge and steel company employing approximately 100 men.

A detailed study of existing educational facilities and industries was made. Outlined in brief, the study included:

1. Investigation of high-school elimination to determine what bearing, if any, the elimination would have on an industrial school.

2. Determination of the number of workers in each occupation in the city.

3. Determination of occupations and place of residence of as many graduates for the five-year period, 1924-28, as possible.

4. Observation of educational needs at first hand by personal visitation, inspection of shops and factories, and conferences with employers. The following facts were observed in making these visits.

- (a) Condition of the work-place and hygienic nature of the work.
- (b) Amount of turnover in the industry.
- (c) Source of skilled labor supply.
- (d) Methods used by workers to obtain skill in the occupation.
- (e) Age of entrance to occupation.
- (f) Opportunity for promotion in occupation.
- (g) Knowledge of processes or operations; what the worker does and what he needs to know.

5. Union limitations and restrictions, if any.

The observations made in the four chief industries of Bellefontaine were written in detail.

After considering the independent establishment of the Sloan Industrial School and the arguments pro and con regarding dual or single control of the school by the trustees and public-school officials, the conclusion was reached that the Sloan School should be operated as part of the public-school system and under its control, with provision made for a committee representing the trustees and the school to determine policies of administration, make financial arrangements, and act in an advisory capacity. It seems to be advisable that the shop buildings and equipment be provided by the Sloan fund. Strict trade training is feasible for boys interested in woodworking and body building at the A. J. Miller Company, for apprentices at the railroad shops, and for those interested in automotive work at the school. To be of greatest value to the boys and girls of Bellefontaine, the school should offer industrial arts in the general shop during the junior-high-school years, and advanced and technical work, vocational in character, in the senior high school. It also seems desirable for the trustees to erect a modern house for the purpose of teaching domestic science. Household arts for boys and girls in the junior high school and in advanced courses in the senior high school, paralleling the industrial arts work, should be available. An activity program in the elementary school would serve as an excellent preparation for the work offered by the Sloan Industrial School.

THE ARTICULATION OF JUNIOR AND SENIOR HIGH SCHOOLS IN OHIO

James Edward Frew, B.Sc. in Agr.,
The Ohio State University, 1922

Department of School Administration

Purpose:

It has been the purpose of this study to learn of the methods now used by city, exempted village, and county high

schools in Ohio to effect articulation among and between the junior and senior high schools.

Procedure:

A three-page questionnaire was used to secure the necessary data for this study. These data have been tabulated, and these tables, with explanations, make up a large part of the body of this thesis. The questionnaire covered seven main items which have been used as chapter headings in reporting the study, as follows:

1. Administrative Procedures and Problems
2. Program of Studies
3. Methods of Instruction
4. Articulation Problems at the Transition from the Junior-High-School Period.
5. Guidance
6. Extra-Curricular Activities
7. General Problems of Articulation

Findings:

Some articulation procedures which are being practiced in many Ohio schools are:

1. Vertical supervision with a consistent scheme of organization and administration that carries over from the junior high school to the senior high school is practiced in 85.2 per cent of the school systems.

2. Formulation of clear statements of the purposes of the junior and senior high schools based upon the needs of the pupils is common in many schools.

3. Provision is made for the continuity of homogeneous grouping in 54.9 per cent of the schools.

4. In 79.6 per cent of the systems reporting, curricula and courses of study are prepared by committees composed of teachers from the junior and senior high schools.

5. According to comments made by 50 per cent of those who returned questionnaires, different school units are informing each other of methods, procedures, and accomplishments.

6. Information is gleaned from the homes, the former schools, and the pupils themselves concerning the aptitudes, desires, accomplishments, and plans for the future of the pupils. These data, along with intelligence and achievement test scores, are carefully considered to some extent in 83.8 per cent of the school systems, when individual pupils are advised.

7. These data are passed on by means of cumulative record forms to the senior high school in the same percentage of systems.

8. In three-fourths of the school systems, report blanks and record cards are similar in both junior and senior high-school units so that there may be a continuous record understood by all.

9. Fifty per cent of the principals state that prospective ninth-year promotees are invited to the senior high school to become acquainted with the building, the courses of study, the pupils, and faculty. They are entertained in assembly and perhaps in the school cafeteria; they hear the principal welcome them.

10. Great care is taken in the registration of pupils in most of the schools.

11. In half of the schools reporting, pupils are assigned to a home-room teacher or specially qualified faculty adviser who is freed from certain teaching and administrative duties so that he has time to give to student personnel.

12. Teachers in junior and senior high schools have been placed upon the same salary schedule in 62.6 per cent of the school systems.

MEAT AND ITS UTILIZATION IN THE OHIO FARM HOME

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The Ohio State University, 1929

Department of Animal Husbandry

The main purpose of this thesis is to include all of the steps in caring for the meat supply on the Ohio Farm from

the live animal to the utilization of the more important by-products. In addition, data and statistics showing the position of Ohio as a livestock producing state and the valuation of her meat-producing animals for the period 1925-1929 have been included.

The consumption of meat and its importance in the diet are discussed in the introductory chapter. Factors which influence the characteristics and composition of meat as well as the health inspection service rendered by the Government are then related.

The demands of the consumer are constantly changing. It behooves the livestock men to produce the market classes and grades of meat that find most ready sale.

A detailed discussion is given on the proper procedure to follow in the slaughtering, dressing, and cutting up of the three important classes of meat, beef, pork, and lamb. All of these meats lend themselves to the preparation of attractive meat dishes, many of which are described. In order to preserve meat for winter use, the details of curing and smoking are discussed at length.

A special study has been made and included on the bacteriology of meat canning. A series of tests was made to determine whether or not the amount of fat, the condition of packing, or previous cooking had any effect upon the keeping qualities of canned pork sausage.

The canned product was divided into two groups, one of which was stored at 60°F. and the other at 98.6°F. After six weeks of storing, no signs of bacterial growth were present. This demonstrates that none of the above conditions had any appreciable effect upon the keeping qualities of canned sausage. It appears that the temperature and length of the processing period are the more important factors.

Lard rendering is discussed both from the farm and from the commercial standpoint. The factors affecting the quality of lard, the commercial grades, and the steps in the rendering process are taken up.

Quite an extended discussion is included on the preparation of the various meats for the table, the correct tempera-

ture at which to roast meats, and the various methods of preparing steaks and chops in the most appetizing and palatable manner.

The by-products of the meat industry and their utilization are discussed under the headings of soap-making and hide-tanning.

All of the above methods of procedure and formulas in the preparation of the meat supply are given with the idea of making them applicable under farm conditions.

THE PLACE ELEMENT IN HIGH-SCHOOL TEXTS ON WORLD HISTORY (A STUDY OF MAPS)

Homer Francis Gant, B.S. in Edu.,
Muskingum College, 1927

Department of Principles of Education

This thesis is a study of the number and character of the maps in four widely used high-school textbooks in world history, and of the use made by the authors of these maps.

The authors show very general agreement in the choice of maps for the ancient and modern periods, but almost no agreement in choosing maps for the medieval period.

The importance of the place element is little emphasized in any of the texts. The general tendency seems to be to insert maps at approximately equal intervals, leaving it entirely to the teacher and pupils what use, if any, shall be made of them.

Thought-provoking questions and exercises involving comparisons, deductions, and implications would make these textbooks more effective teaching instruments.

THE EARLY HISTORY OF THE REGULATION OF CHILD LABOR IN OHIO

Glen Leiby Ganyard, B.A.,
Hiram College, 1924

Department of School Administration

The purpose of this study was to show the nature and the extent of, and the factors contributory to, the regulation of the labor of children in Ohio down to 1890. The governors' messages, the reports of the commissioners of common schools, the proceedings, addresses, and papers of the Ohio State Teachers' Association, the journals of the Ohio house and of the Ohio senate, and the personal histories of the legislators who were active, were studied. A search was made for reports, papers, records, and activities of child welfare associations, committees, and the like, but it was found that these organizations have originated since 1890.

In the governors' messages there were no references to child labor and only two to related topics. The reports of the commissioners of common schools have only one direct and four indirect references. In the proceedings of the Ohio State Teachers' Association there are no direct references to child labor, but there are several to school attendance, which is a closely related topic. The search of the biographical information of the legislators revealed but one satisfactory biography.

As a background, a brief account was given of the origin and early treatment of the problem in England and in the United States.

The study proper was divided into parts, as follows: 1799 to 1870, 1871 to 1880, and 1881 to 1890, to afford convenience in treatment, and because the regulations in these periods seem to indicate somewhat different tendencies and reflect to some extent different influences. Apparently the influences came indirectly from humanitarian and educational sources.

The sources examined for the period from 1799 to 1850 gave no evidence of agitation, and the only enactment was the ten-hour-day law for mechanical and manufacturing trades.

In the period from 1871 to 1880 the agitation points to neglect of the welfare of children, to children's negligence in attending school, and to their merchandising in industry by parents. The laws important to this study, which were passed, were: to regulate mines and mining, to prohibit children from employment in mendicant and vagrant trades, to secure to children the benefits of an elementary education, and to prevent cruelty to minors.

The agitation of the period from 1881 to 1890 was indirect and was almost entirely about compulsory attendance. Laws were passed to establish the eight-hour day, to compel children to attend school, and to prevent the employment of children in dangerous places.

Census reports and labor statistics do not indicate that the regulations were effective until 1890, in which year a decided change for the better was recorded.

At the close of the period children were limited to eight hours per day in mechanics, manufacturing, and mining, unless they contracted otherwise, and were prohibited from these occupations unless they had met certain educational standards. They were not permitted in vagrant and mendicant trades until seventeen, in mining until fourteen, and in dangerous places until sixteen years of age.

SOME SOCIAL AND ECONOMIC FACTORS IN THE RISE OF FEUDALISM IN JAPAN

Clark Peter Garman, B.A.,
Western Reserve University, 1905

Department of Sociology

Prehistoric Japan had developed an aristocratic society in which there was a dual social organization, with partial

overlapping but with the clan system dominant. Privilege, arising in racial conflict and secured by military supremacy, was confirmed to the few by religion, by social grouping, and by political organization.

In the seventh century, problems arising from increased numbers and territorial expansion, and augmented by contacts with the advanced continental civilization of which Buddhism was a part, brought the knowledge that the clan system would end in disaster. A Reform government revamped the social and political organizations and the economic system, but maintained the supremacy of the ruling classes while establishing a centralized government and leaving the clan as a social, but not political, entity. Economically, the new state was based on an equal allotment of all the cultivated land, in theory now public, and was maintained by a system of taxation containing the three previous forms—produce tribute, forced labor, and land tax. However, persons of rank and merit were granted estates much larger than the allotments to the populace, and they and their lands were exempted from taxation. Uplands, waste lands, and all lands in the undeveloped frontiers were omitted from the allotment.

In regard to the small, scattered farms of irregular rice-fields demanding intensive labor, individual ownership and use of lands backed by previous conceptions and custom, was established as before. Reclamation of waste and new land gave opportunity of extending the tax-free estates of the nobles. In this, the privileges of official position coöperated. Taxation, abused, became onerous to the peasants. They sought relief by “commending” their lands to the nobles and continuing to rent them, by becoming servants in the Home Provinces where forced labor was inoperative, by becoming outlaws, and by migrating to the frontier where government control was almost, if not quite, lacking. Increased government expense with decreased tax receipts united with other causes to weaken the government. Ainu wars replaced an efficient conscript army by an army of the official nobles commanded by other nobles trained in the

Imperial Guards. Landed estates and force of arms combined to elevate the nobles. Clan life was again magnified and began to take again political significance. The Court was constrained to call to its aid the clan warriors. Peasants became their vassals. A century of strife was ended when one clan chief gained control of all the lands of the empire. His vassals were put into every province as military protectors, and into every estate as land stewards for its supervision and the collection of taxes. Thus was feudalism established.

AN AGE-GRADE AND GRADE-PROGRESS STUDY OF RICHLAND COUNTY SCHOOLS

Ralph Merrill Garrison, B.S. in Edu.,
Ohio University, 1925

Department of School Administration

The purpose of the survey was to determine the efficiency of the school system by means of an age-grade and grade-progress study. For the purpose of comparison, the schools were divided into township elementary, centralized elementary, village elementary, and high schools. The pupils included in the study were classified according to sex so that a comparison was possible. A study of the age of entrance, the frequency of failures, and double promotion was included.

Findings:

The schools of the county have 18.3 per cent of the pupils over-age and 17.8 per cent under-age. The township schools show the highest percentage of over-age pupils and the centralized schools the lowest. In every type of school the number of boys over-age is greater than the number of girls. The schools have 4.5 per cent of the pupils accelerated and 28.8 per cent retarded. More boys than girls are

retarded. The township schools have the highest percentage of retardation and the high schools the lowest. The withdrawal point in the school system is between the eighth and the ninth grade. The enrollment in the high school shows a large decrease between the tenth and the eleventh grade. The study shows more failures among the boys than among the girls, with the first grade showing the highest frequency of failures. Very few pupils have received double promotions. The grade most frequently skipped is the second. Twenty-two per cent of the pupils enrolled entered the school before reaching the age of five years and nine months.

Recommendations:

The schools should take steps to reduce the number of over-age pupils and the amount of retardation, and should study the causes of these conditions. There should be a cumulative permanent record system established in each school and in the office of the county superintendent of schools.

THE *Mythographi Latini* AS A POSSIBLE SOURCE FOR THE
Integumenta BY JOHN OF GARLAND

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The Ohio State University, 1929

Department of Latin

This thesis is a study of a thirteenth-century document attributed to the Englishman, John of Garland, which under the title *Integumenta* is an allegorical commentary on Ovid's *Metamorphoses*. This study is made in order to determine the relation this commentary bears to the mythological writers contained in the collection known as the *Mythographi Latini*.

Comparison between these writers and John of Garland

has been made from the point of view of language, general thought and expression, and rationalistic interpretation, and it has been possible to conclude:

1. That John of Garland was familiar with the *Mythographi Latini* and borrowed material from them.

2. That he used material from all three mythographers.

3. That in the case of passages for which we know the Mythographi served as a source, he drew most frequently from the second writer.

4. That whereas in some cases he evidently had in mind the statement of one particular writer of the group of the Mythographi, in others his reference is more general, since he agrees in matter and manner of his statement with the treatment found in more than one of his possible sources, whether all the Mythographi or other writers.

5. That we need not assume that John of Garland always had the manuscript of these Mythographi before him, but that his references may be explained by his thorough knowledge of them.

In addition, it has been possible in the case of a few passages which have no parallel in the mythological collection to point out a definite source.

ITEMS THAT SHOULD BE INCLUDED IN AN IDEAL HIGH-SCHOOL MANUAL

Ralph Henry Getz, B.S. in Edu.,
Ohio Northern University, 1918

Department of School Administration

This study is based on the high-school manuals of administration and organization prepared by state departments of education. An attempt is made to determine what items of information an ideal high-school manual should contain to be most helpful to the high-school administrators in con-

ducting an efficient program of secondary education.

The present state manuals were analyzed and every item found in any manual was listed. These items were grouped under twenty-seven major topics in the form of a questionnaire which was sent to high-school principals, superintendents, high-school teachers, state high-school supervisors, and college professors in every state in the United States. These individuals considered each item from the standpoint of its value in a high-school manual and checked it as (*a*) absolutely essential, (*b*) desirable but not essential, or (*c*) not necessary to be included in an ideal high-school manual.

The judgments on each topic, of each group of educators, are tabulated separately and show the opinion of the group. The judgments of the five groups on each topic are then tabulated collectively, and from this table the items which 50 per cent or more of the judges think absolutely essential to be included in an ideal high-school manual are so listed. A secondary list is made containing the items which the same per cent think desirable but not essential.

No attempt is made in this study to determine or define the standards except in so far as is necessary to clarify the nomenclature of the various terms.

The following is a brief summary of the items considered absolutely essential to be included in an ideal high-school manual:

1. A brief survey of the high-school situation in the state.
2. Definitions of the terms used in the manual.
3. State requirements on certain items concerning the administration and organization of the high schools.
4. Academic and professional requirements of the staff.
5. A statement of the aims and objectives of secondary education.
6. A statement of the aims of each curriculum accredited.
7. College entrance requirements of state-supported colleges and universities.
8. Standards for the library and library service.

9. Suggestions on the aims of an extra-curricular program.

Items considered desirable but not essential are listed under the following general topics: technique, school plant, equipment, programs of studies, college entrance, apparatus lists, course of study, guidance, school finance, books, elementary schools, and general items.

THE POETRY OF RUPERT BROOKE

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The purpose of this essay is to evaluate the contribution made by Rupert Brooke to English poetry. The material under consideration comprises: (1) his life; (2) his studies; (3) his realism; (4) his idealism; and (5) his technique. Since Rupert Brooke died before he had combined his excellent poetic gift with any structural belief in life, although he may have been upon the verge of discovery, our judgment of him must be tentative. This essay attempts to analyze the intrinsic worth of his poetry, without indulging in the invidious procedure of estimating his rank among his contemporaries.

Brooke left a slender legacy of poetry, whose quality is sufficiently enduring to assure him of immortality among the minor English poets. He brought to the infinite variety of objects in nature a joyousness and freshness of perception, coupled with an absolute mastery of words, which has resulted in some of the finest sensuous imagery in the language. His insight into the workings of the human heart produced exquisite pictures of subtle moods and transient states of feeling. Such penetration into the emotions, joined with a vivid sense of contrast, led to the creation

of the dramatic sonnet, of which he is one of the few masters. In order to accustom himself to the anguish of parting from physical beauty, Brooke portrayed ugliness with striking realism. His passion for sensuous experience, linked with dread of death, aroused in him the desire for an after-existence, preferably one in which sensation would still be possible. His quiet quest for a tenable personal philosophy occasioned the writing of several poems whose other-worldly beauty is a distinctive contribution to English poetry. His is a vision heightened and colored by his sensitive reactions to the physical world and by his ability to realize the abstract in vivid imagery. His poetry is a treasury of aesthetic experience.

Fully as important is Brooke's literary craftsmanship—his inspired use of words, live, mobile, and luminous, to convey his impressions. Brooke was a master of the best literary style, subjecting a natural exuberance of feeling and of thought to the restraint of conventional forms. His work is balanced and symmetrical. At the same time, it possesses more than ordinary flexibility, due to his experimentation in forms and to his judicious introduction of rhythmical variations.

Brooke, again, is one of that company of lesser poets, whose note, though short, is true.

THE USE OF THE SUPERNATURAL IN ELIZABETHAN DRAMA

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Department of English

With the arrival of legitimate science into modern thinking, literature thought to abandon all but the most sensible and explicable phenomena. Yet in dramatic literature there appeared a Dunsany with *The Gods of the Mountain*, a

Yeats with *The Land of Heart's Desire*, and a Jerome K. Jerome, in a different category but as definitely tainted, with *The Passing of the Third Floor Back*. It is not strange, then, that if a culture of such sophisticated knowledge as modernity vaunts, will permit itself to be entertained by the fantastic and the supernatural, the Elizabethans, interested not so much in the relation of truth to fact as in that of truth to life, should have enjoyed a drama peppered with persons and processes which nobody pretended were true.

There were in general, perhaps, three possible ways of looking at the supernatural as presented on the Elizabethan stage. It might be taken seriously as true enough fact. The popular ghost may have been thus understood. Certainly the witches in Heywood's *Lancashire Witches* and in *The Witch of Edmonton* were so treated. It might on the other hand be pure fantasy with no pretensions to fact, as was the case in the Masques, in Shakespeare's fairy forest, and the enchantments of both *Endimion* and *Old Fortunatus*. Or it might take the comic form of satire in which certainly the audience, and usually part of the stage characters, realized before the play was over that all extra-human agents and events might not be so extraordinary as they seemed. The distinction is not always definite. Indeed, it was all-important to the citizens who went to the Globe and Fortune not to analyze but to be entertained.

For purposes of discussion the field might be divided arbitrarily into supernatural persons and supernatural events or processes. Of persons there is an assortment again arbitrarily divided into the following classes: personifications, as Revenge in *The Spanish Tragedy*; good and evil angels, and Angelo and Harpax in *The Virgin Martyr*; the ghost and apparition group, appearing elsewhere but especially characteristic of the tragedy; devils, witches, and magicians, appearing preponderantly in realistic drama, with the witches in *Macbeth* and Dr. Faustus' Mephistopheles notable exceptions; and finally the fairies, found particularly in romantic comedy, which Shakespeare achieved most gracefully. The second general category

includes omen and prophecy on the one hand, and induced magic or enchantment of whatsoever kind, on the other. Omen and prophecy only foretold, but magic influenced the future.

Survey may be made rapidly from the three suggested viewpoints. Examples of each section fall into one or two or perhaps all three of these groups.

1. Personification must have been pure romantic assumption.

2. Ghosts, generally believed in, have not departed from the popular mind even of today. The frequently subjective ornamental ghost called out of the mind of the character, as Banquo at Macbeth's banquet, and Isabella, called by the mind of her brother in *The White Devil*, were popular. But the purely objective and motivating ghost of Hamlet's father was also a great favorite. Chapman's extensive use of ghosts of that sort indicates the temper of the public mind. If doubts were ever present they did not interfere with the popularity of the plays arousing them, for these plays continued to be written and played for a long period. If existent, they were no doubt promptly superseded by romantic assumption. The satire in the *English Traveller* involving a house haunted by a ghost cast no reflections on the conception as a whole. It served, merely, as varied embroidery on the old gulling theme.

3. Apparitions of one type accompanied the popular ghost, and answered to its description. If the bloody child which appeared to Macbeth at the behest of the three weird sisters seemed a bit too much for ordinary belief, the Elizabethan had only to refer to contemporary history, religious and secular, for equally remarkable appearances. The more subjective imaginings, as for example that of the cardinal's conscience which provoked visions of a "thing with a rake" in his fishpond, are more plausible only to modern thinking.

The Masque apparitions of superhuman beings, satyrs, Cupids, Venus, and so forth, were more romantic fantasy joyously adopted for the occasion.

4. The case of the devils is not so clear. Certainly Pug in Jonson's *The Devil Is an Ass* and perhaps the minor devils in *Friar Bacon and Friar Bungay* were beings erected for the dramatic purposes of clowns, and involved no serious belief. Mephistopheles, though legendary, was plausible. But the devil familiars, of which Mephistopheles and Coreb (*The Merry Devil of Edmonton*) were high-grade variations, were part and parcel of the generally conceded witchcraft. Witness only: *The Lancashire Witches* and *The Witch of Edmonton*.

5. The witch conception is a prime example of complete acceptance of supernatural humbug. Witches were transferred sincerely and without question to the stage. Magicians and wise women were contemporary persons. When the drama went so far as the prodigious Sacripant in Peele's *Old Wive's Tale* and Shakespeare's Prospero, the popular mind may have had recourse to its romantic tendencies, but not necessarily nor to any great extent. The same sort of thing might be suggested in connection with the witches in *Macbeth*, a group almost too unearthly for the native English conception. Satire on the charlatan and fake wise-woman in *The Wise Woman of Hogsdon* and *The Alchemist* shows some evidence of disbelief.

6. The fairies are, perhaps, the best example of pure romantic assumption. Brand and Keightely both indicate that by Shakespeare's time the fairy superstition, though still prevalent in certain localities, was generally discredited. This seems to be corroborated by the attitude in the drama. Blithe disregard for any real and actual world with limitations is characteristic of the plays in which they appear. Witness: *Endimion*, *A Midsummer Night's Dream*, and the various fairy Masques.

The few less sophisticated who still found it possible to believe in fairies are properly satirized in the Jonsonian presentation of the gullible Dapper with Doll dressed up as queen of the fairies. The other famous hoax on the same theme is the gulling of Falstaff in *The Merry Wives of Windsor*.

7. Though oracles and auguries were somewhat out of date, omens and superstitions of various sorts were legitimate. The oracle in *The Broken Heart*, the vision of Jupiter in *Cymbeline*, and the beast without the heart in *Julius Caesar* may have required some romantic obliviousness on the part of the audiences, but this was not true of other lesser omens. Astrology (*The Roman Actor*), fortune telling (*The Spanish Gypsy*), and dreams (*The Duchess of Malfi*) were popular enough to appear with no such demand upon the imagination of the audience.

8. The use of magic is similar. Medicine and other sciences, alchemy for example, were scarcely out of the realm of magic. Tests for chastity (*The Faithful Shepherdess*, *The Changeling*), magic potions (*Midsummer Night's Dream*, *Witch*), and other magical arrangements appeared in drama as actual fact, as had the witches. There is on the one side of that genuine belief the fairy-story magic purse and hat in *Old Fortunatus*, and on the other, the adequate satire of various sorts of magical charlatanry in *The Alchemist*.

FUNDAMENTALS OF STAGE GROUPING

Paul Joseph Harris, A.B.,
Otterbein College, 1923

Department of English

The aim of this thesis is to make a preliminary codification of the simplest and most fundamental principles used by a stage director in directing the presentation of a play.

First, those fundamental principles are considered which are common to directing and to the arts of painting, sculpturing, and drawing. These are, with a brief explanation of each:

1. Significance of simple line

A consideration of the emotional effect of vertical and

horizontal lines and their deviations and proportions on the stage.

2. Significance of the relation of lines
Repetition, sequence, and opposition.
3. Significance and relative importance of masses
The importance of masses is dependent upon density or solidity, shape, position, and the variations of color.
4. Significance and relative importance of the variations of color
Color varies in hue, intensity, and value
These must be considered in stage groupings.
5. Principles of emphasis
The stage areas, the facings, and the levels of the actor.
6. Balance
Symmetrical or occult balance, a balance of masses or a balance of interest.
7. Focus
Emphasis can be placed on a stage by the focusing of attention on a particular spot.
8. Abstract expression of the fundamental idea
A certain "ness" or quality which may be the fundamental idea of a play or a scene, must first be discovered and concentrated upon.

The next group of fundamental principles considered consists of those which are common to music and to stage groupings, as follows:

1. Rhythm or repetition
2. Monotony and monody
3. Climax
4. Anti-climax
5. Contrapuntal movements (the similarity of the stage picture to a chord in a musical composition)
6. Shock
7. Surprise

The possibility of a consideration of the principles common to directing and to dancing was contemplated, but since music contains all the elements of dancing except the suggestions made by physical movements, we have made only one more classification, namely, those fundamental principles which are peculiar to the task of the director. The ones we have listed are as follows:

1. Movements and their relative importance
2. The temporary plot importance of a character
3. The use of principles of emphasis with reference to the plot
4. "Stars"—a factor to be overcome
5. Suspense by means of groupings
6. Suggestion by means of groupings

An attempt has been made to show that the director has a definite and peculiar contribution to make in the production of a play.

Finally, a consideration of the approximate methods that have been recorded in the most valuable of the present works on play directing completes this preliminary survey of the art of directing.

PATHOLOGICAL LESIONS OF PULLORUM DISEASE

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Department of Veterinary Pathology

In view of the fact that a variation exists in the literature as regards the lesions which occur in baby chicks affected with Pullorum Disease, a study was made of the lesions occurring in chicks naturally infected with *Salmonella pullorum*, in comparison with the lesions occurring in chicks with other diseases.

Source of Material:

The chicks used for this study were those received at the Veterinary pathology laboratory of the College of Veterinary Medicine at The Ohio State University during the winter and spring of 1930. Two hundred and thirty-one chicks, ranging in age from three days to five weeks, were used. One hundred and twelve were positive and 119 were negative for *Salmonella pullorum*, as determined by bacteriological culturing of the livers, unabsorbed yolks, heart blood and lung nodules. The chicks were grouped for study according to their ages by weeks.

Gross Pathology:

The pathological lesions that were observed in *S. pullorum* positive chicks were: (1) retarded absorption of the reserve yolk; (2) retarded absorption of the fat from the liver; (3) congestion of the liver; (4) gray foci in the liver; (5) congestion and edema of the lungs; (6) pneumonia; (7) catarrhal enteritis; (8) whitish foci in the myocardium and pancreas.

The lesions which occurred more frequently in the chicks with Pullorum Disease than in those with other diseases were: (1) retarded absorption of the reserve yolk; (2) congestion of the liver; (3) pneumonic conditions; and (4) whitish foci in the myocardium and pancreas.

Microscopic Pathology:

A study of stained sections from the livers revealed that the yellow color which is observed macroscopically, is due to the normal fat content of the livers of very young chicks. Little fat was observed in the livers which had attained a red color. Areas undergoing fatty degeneration were observed in the livers of both positive and negative chicks. The gray foci in the liver were the result of infiltrations of degenerated areas by endothelial leucocytes.

The whitish nodules which were observed in the lungs were the result of infiltrations by endothelial and polymorphonuclear leucocytes, and an exudate in the bronchioles and alveoli containing leucocytes and desquamated epithelial cells.

Foci in the myocardium and pancreas were the result of a degeneration of the parenchymatous cells, with an infiltration by endothelial and polymorphonuclear leucocytes.
Summary and Conclusion:

From this study, it was concluded that Pullorum Disease could not be diagnosed with a high degree of accuracy, by the pathological lesions encountered. No lesions were observed in chicks affected with Pullorum Disease which were not also observed in the other chicks studied.

INTERCORRELATIONS OF SCORES FOR SCIENTIFIC APTITUDE GENERAL, AND SOCIAL INTELLIGENCE, WITH GENERAL AND SCIENCE SCHOLARSHIP

Virginia Riddle Hathaway, A.B.,
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Two-hundred and forty students in general psychology classes at Ohio University, 160 men and 80 women, were given the following tests: Stanford Scientific Aptitude Test, Ohio State Psychological Test, and George Washington Social Intelligence Test. Scholarships were figured in point hour ratios for subjects taken as a whole and for science subjects alone.

When inter-correlations, zero, first and second order, were worked for the five variables, the following findings were outstanding.

Scientific aptitude is positively but not highly related to general and to social intelligence, and also to scholarship. General and social intelligence show evidence, both in the correlations with each other and with scholarship, that they are measuring significantly similar traits. There is basis for belief that individual guidance programs in colleges may be aided by the use of tests measuring these aptitudes.

For women students, according to our findings, the most successful prediction of scholarship can be made by the use of all three of the tests. For the men, the general intelligence test offers practically as valuable a predictive power. Prognosis for scholarship is better for the women than for the men with any one of the tests, except that for social intelligence.

A STUDY OF SCHILLER'S HEROES AND VILLAINS

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Department of German

Even a casual reading of Schiller's dramas reveals the fact that many of the important characters show rather striking similarities. The purpose of this thesis is to discuss and compare the important male characters of these dramas and to classify them as members of a distinct type.

Schiller's heroes may be divided into two distinct types, the youthful heroes and the more mature. The youthful heroes, Karl Moor, Ferdinand, Don Carlos, Max, Melchtal, and Demetrius, are treated first. They are, one and all, young idealists rebelling against the existing state of society. But they have a very limited range of experience and use poor judgment in making decisions. In general, all are passionate and sentimental and show a lack of self-restraint. The more mature heroes, Fiesco, Verrina, Posa, Philipp, Wallenstein, and Tell, are, on the whole, men who are more calm, less idealistic, and of wider experience. They usually exercise good judgment and weigh matters more seriously than the former group, before proceeding into action.

The villains are also presented as characters of two types, the melodramatic villain and the dramatic. Franz and Ges-

sler, villains of the first type, reveal themselves as champions of absolute tyranny, disregarding the rights and privileges of other men. They represent the outright, unscrupulous scoundrel who is interested only in the brutal satisfaction of his ego. Octavio, the dramatic type of villain, is much less extreme, and does not gain his end by brute force or crude deception, as do Franz and Gessler, but rather by his keen understanding of human nature and by ingenious hypocrisy.

The relation of each character to the drama in which he is presented, is briefly discussed as an introduction to the character sketch. Concluding the various discussions, some of the similarities existing between the author and the character, have also been enumerated.

In conclusion, the development of Schiller's own character and ideas has been traced in the character portrayal of Karl Moor, Max, and Demetrius. This gives us with fair accuracy the different stages of development through which the author himself passed in the course of his life.

A STUDY OF COMMERCIAL TEACHERS' AGENCIES

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Department of School Administration

This study was undertaken to ascertain such facts about commercial teachers' agencies as origins and development, type of founder, type of director, and services rendered society. It was intended, too, to show the methods employed by these agencies as well as the costs of their services to the teachers and to the agencies. Other objects were to discover, if possible, what teaching fields are over-crowded, what ones under-supplied, and what qualities or characteristics of candidates are considered serious handicaps to their placement.

To obtain the information needed, a questionnaire was mailed to 173 agency managers, 32 of whom replied with sufficient data to be useful. From these data and those found in the literature of 85 other agencies, the following conclusions, among others, have been reached.

The first commercial teachers' agency in this country was founded in 1846 by Samuel Whitcomb, Jr., at Boston, Massachusetts. The movement reached the Pacific coast by 1877, and has grown until there are now at least 170 such agencies, one or more being found in each of all but 11 states.

The average commercial agency has been operating for 24 years, was founded by an experienced school man, and is now directed by such a man who has been connected with teacher placement work for more than 12 years; it enrolls 1,500 or more members and places one-eighth of this number annually. The enrollment fee does not cover the actual costs of enrollment, but an estimated profit of \$37.50 is realized on the average placement, above the estimated placement cost of \$30.62.

These agencies enroll more academic teachers, especially teachers of English and history, than they can possibly place, and fewer qualified teachers of special subjects than there are opportunities of placement. The inexperienced teacher has better chances of placement through commercial agencies than has the experienced teacher, and the grade teacher has better chances than has the high-school teacher.

Employing officials appear to be more interested in a candidate's age, size, appearance, family affairs, and religion than they are in his professional preparation and moral fitness, although they hardly consider party politics.

Reported major handicaps to placement are in order, as follows: poor personality, lack of experience, religion, married state, and age.

LESSON PLANNING IN THE SECONDARY SCHOOL

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Historically, lesson planning before 1860 was little more than the teacher's preparation of the subject matter. However, with the advent of object teaching we note that in the period from 1860 to 1890 increased demand for better trained teachers gave impetus to the normal school movement, and by the end of this period, written lesson planning was fairly well established. In general these plans took on the nature of detailed questions and presumptive answers.

The inductive method arose as a competing method to object teaching. This influential method was introduced in America by some of the leading educators of the day who had received a part of their higher education abroad. Here they became influenced by the teachings of Herbart. As a result, the "formal steps" became the basis for a universal method of planning, and their introduction into this country marks well the beginning of formal written lesson planning in the United States. They seem to have been quite generally accepted as a necessary prerequisite to successful teaching, by both the normal schools and the leading educators.

Ideas of lesson planning, at the beginning of the twentieth century, began on the crest of the wave of Herbartianism. However, within a decade some of its leading proponents began to modify its plans. With a changing conception of the nature of the organism, there is an evident transition in lesson planning from the Herbartian formal steps to a type of plan that considers primarily the growth and development of the child, known as the "unit." Consequently, within the last decade the Herbartian lesson plan has been on the wane and has been substituted by various plans which aim to provide more for the differences in individuals.

An inquiry was made by sending questionnaires to the

teacher training institutions and a representative group of school administrators and classroom teachers of Ohio, to determine the present attitudes toward the practices in the use of the written lesson plan in the secondary schools of Ohio. The results show that:

1. Most of the secondary teachers of the state were taught to write plans, and of these teachers only about one-third now use the plan which they were taught.

2. Much variation exists in the type of plan recommended. The tendency is distinctly toward more flexibility.

3. The "unit" plan is fast gaining popularity.

4. It is felt that lesson planning should be required of beginning teachers and optional with experienced teachers.

5. The tendency toward "unit" planning increases the necessity for writing the plans.

Recent trends in lesson planning are an outgrowth of a newer psychology of the learning process. The child is viewed as an active dynamic organism, partially equipped at birth with ways of behavior toward its environment; it learns through experience; its behavior is purposive, directed by a concomitant interaction of the organism and the environment. It learns by means of a thinking process which is based upon concepts and meanings.

Educationally, this calls for a lesson plan such as will provide for: (1) the identification of the learner with the aims and purposes of a unit; (2) the development of individual differences; (3) a recognition of the instrumental value of subject matter; (4) the learning products in terms of attitudes, understandings, and social adaptations of the individual to his environment.

The "unit" is recommended and illustrated as the type of plan which will meet the above requirements.

THE STATUS OF EDUCATIONAL GUIDANCE IN THE MEDIUM-SIZED HIGH SCHOOLS IN OHIO

Lawrence Henry Houpt, B.S. in Edu.,
Ohio Northern University, 1921

Department of School Administration

Definitions:

Educational guidance is the giving of advice to a student on the choice of curriculum, subject or subjects, and is based upon information gained through tests, measurements, interests, observation, interviews, and ability of the student.

Medium-sized high schools are those whose enrollment according to the State Department of Education Directory for the school year 1929-1930, is from 101-500 inclusive. The aim is to find out what the above-sized high schools are doing in curricular and subject guidance, as well as the organization in the city, village, and county schools of the above size, for this phase of school administration.

Procedure:

An inquiry seeking the following information was sent to 300 of the medium-sized high schools:

1. General information about the character of the school
2. The nature of the school's testing program and the uses made of tests
3. The status of the individual interview and the basis for it, as well as the policy in a follow-up program after these interviews; likewise, the personnel of the school giving the advice
4. School and curricular organizations functioning in educational guidance

The factors are the individual and the curriculum. A knowledge of the ability of the individual and an understanding of the different curricula are essential in such a study.

Conclusions:

1. The medium-sized high schools are not making use of the standardized tests to the fullest possible extent, for 32.2 per cent of the schools do not give the intelligence, achievement, and prognostic tests. Only 89.4 per cent give intelligence tests, 83.8 per cent give achievement tests, and 30.2 per cent give prognostic tests.

2. Better progress in eliminating failures has been made by those schools which have been using a testing program. This is verified by the fact that 55 per cent of the city schools, 68.1 per cent of the village schools, and 76 per cent of the county schools in this study using such a program have made more progress.

3. Between 97 and 99 per cent of the schools in this study are using the individual interview in subject and curriculum guidance. In 96.5 per cent of these schools the principal is the leading adviser, and the home-room teachers follow next in importance in 54.9 per cent of the schools.

4. Remedial work comes as a result of the testing program and the individual interview. In 73.9 per cent of the schools such work is offered in the way of dropping a subject, pursuing additional work, changing a subject, changing curriculum, or securing the minimum essentials in a course.

5. The organization of the school and curricular guidance activities is very important in educational guidance. In 65 per cent of the city schools, 68.1 per cent of the village schools, and 58 per cent of the county schools, there are home-room organizations.

As to the organization of the curricula, 68.3 per cent of the schools have an organized curriculum from which the boy or girl may choose. The cities in this study have 18 different curricula, the villages 15, and the county schools under county supervision 21. In 78.1 per cent there is a free choice of electives if there is sufficient demand for the subject to be offered.

Also the course in "how to study" is found to help eliminate failure in 76 per cent of the schools that are making use of such a course.

General and exploratory courses are offered to some extent. Only 36.6 per cent of the schools, however, offer exploratory courses. In general science 83.8 per cent of the schools are offering it, and in household arts, 87.3 per cent. However general language, composite shop work, and general mathematics have very low offerings.

The course in occupations is offered in 64 per cent of the schools, and the course in vocational civics in 35.2 per cent of the schools.

6. As to an activity program of an organized nature with the idea of educational guidance prevailing, only 45 per cent of the city schools, 50 per cent of the village schools, and 38 per cent of the schools under county supervision have semblances of such an organization.

Final Conclusion:

The status of educational guidance is such that it prevents educational guidance from contributing to the fullest efficiency of instruction in the medium-sized high schools of Ohio.

Recommendations:

1. The testing program should be extended since better progress is reported by schools using such a program.

2. Pupil record, interest, ability, and test results should be more closely adhered to in giving advice, since better progress results in eliminating failures, and consequent dropping out of school.

3. Advice in the individual interview should be based upon the marshalling of all the facts revealed by pupil record, test, interest, and ability rather than by "trial and error" methods as some of the cases show, for the individual interview outruns the testing program by 30 per cent.

4. The home-room should be more fully organized since the home-room teacher is next to the principal, in impor-

tance in educational guidance, and this phase of guidance is partly under this teacher.

5. Since 76 per cent of the schools offering the course in "how to study" have found better progress in eliminating failures in school work, perhaps it would be advantageous to introduce such a course in the school program.

6. The principal and the teachers should have training in educational guidance since they are the ones who are administering it in the medium-sized high schools.

7. Exploratory courses should be offered.

CREATIVE SUPERVISION OF STUDENT TEACHING

Sydney Evelyn Hughes, A.B. in Edu.,
Howard University, 1917

Department of Principles of Education

The purpose of this study is an attempt to show the need of a new type of laboratory experience in student teaching in the teacher-training institutions and to suggest a practical program by means of which this experience may be secured. The material used as a basis for the study was collected from available literature on the subject.

This thesis contains five chapters. In Chapter I the writer sets forth the introduction to the study. Changes in American civilization have necessitated corresponding changes in education. The demands upon the schools are greater now than in any other period in the world's history. There is need of trained leaders who understand the problems and controversial issues of the age and who can adapt instruction to meet the needs of youth both individually and in relation to the social group.

Chapter II presents the various conceptions of supervision, namely, administrative, close, scientific, and creative

supervision. The underlying principles of each are briefly outlined. This part of the study reveals the fact that creative supervision is the type best fitted to give the proper guidance to prospective teachers.

In Chapter III the philosophy which should form the basis for a creative program of supervision is set forth. Major objectives and fundamental principles for guidance in the supervisory program of student teaching are given with a brief discussion of each.

Chapter IV presents suggestions for a practical program of student teaching based upon the ideals as outlined in the philosophy of creative supervision. The activities of the student-teaching program, namely, directed observation, student participation, and actual responsible teaching in a real classroom situation, are discussed in detail. The setting, type of leadership, laboratory facilities, and supervisory program as presented are intended to give the prospective teacher training in real experience in discovering classroom problems and in working out satisfactory solutions to the same.

Chapter V, the last chapter, summarizes the findings of the study. It is the writer's conclusion that if the students in training are afforded an opportunity for real experience with children under the dynamic leadership of creative supervision, the work will be vital in preparing the prospective teacher for making proper adaptations in the classroom after leaving school. It should be the real function of training activity to suggest and encourage the development of a body of ideas which will stand forth in the student's mind both as a background of reference in his attack upon the problems of teaching and as a set of principles to guide and direct him in his teaching procedures.

THE RISE OF THE JUNIOR-HIGH-SCHOOL MOVEMENT IN OHIO

William Clarence Hunnicutt, A.B.,
Ohio University, 1917

Department of School Administration

The purpose of the thesis is to discover the causes of the origin of the junior high school in Ohio, to study the nature of the school with reference to aims and characteristics, and to trace the history of the movement in Ohio.

The method used is the collection and compilation of data dealing with the development of the Ohio junior high school. A picture of this movement, based upon the quotations of various writers on the junior high school, is portrayed. The sources of the data are the educational literature of the period in which the junior high school has been in existence.

Authentic data show that the junior high school originated in Columbus, Ohio, in 1909 as the result of overcrowded conditions. The junior high school, which began as a means of handling crowded building conditions, is now justified almost entirely on the ground of satisfaction of educational principles.

Partly because of its prominence in the struggle for public education, it was natural that Ohio should have been the first state in the Union to set up a junior high school.

Although the first junior high school was established in Ohio in 1909, the institution did not receive legal recognition through statute law until 1917. In the meantime the institution was growing increasingly popular in the state, and the number of schools has now gone far over the hundred mark. The standards of teacher qualifications have been gradually raised since the inception of the school.

The history of the development of activities, curricular and extra-curricular, in Ohio junior high schools is brought out in detail. These activities have made the Ohio schools preëminent as schools for exploration and for the vocational and avocational guidance of youth.

The literature next pictures the goals that are possible of achievement in the junior high schools in the smaller towns and cities of Ohio.

The study ends with a summary of the entire work and the conclusions reached. A survey of the literature on this type of school, showing the rapidly growing tendency for the junior high school in Ohio to supplant the traditional grammar school, and its great popularity with educators, leads one to the conclusion that the junior high school will be a part of the educational system in Ohio for many years to come.

REDISTRICTING THE SCHOOL DISTRICTS OF WAYNE COUNTY, OHIO

Wilbur Clay Hushour, A.B.,
Baldwin-Wallace College, 1918

Department of School Administration

The study showed some of the weaknesses of Wayne County's present school organization. It considered: (1) the inequality of educational and social opportunities offered to pupils in one-room and two-room elementary and small high schools as compared with the opportunities offered to pupils of larger school units; (2) the inequality of wealth per enumerated pupil in the several school districts; and (3) a plan to equalize more nearly these advantages throughout Wayne County.

Seven community centers were determined by a consideration of the community interests of the rural families having at least one child in school during December, 1929. The criteria used in determining the community centers were those points at which the rural families bought their groceries and attended church, grange, or lodge; the location of their telephone centrals; the density of population; the net-

work of roads leading to the centers; and, whenever possible, the pupils' choices of high schools.

A school-building program and a program for pupil transportation were discussed as to utility and estimated cost.

In order to equalize more nearly the educational, social, and financial abilities of the several school districts of Wayne County, the writer recommended that:

1. The Ohio Legislature pass legislation providing that another board of education of five members, elected at large, shall supersede the existing local and county boards in Ohio and be given authority, within certain limits, to consolidate the schools within their own county. However, bonds should not be issued without the vote of the people.

2. Ultimately all schools of Wayne County be consolidated at the seven community centers.

3. School buses be provided by contract for the first two or three years.

4. School buildings and sites be provided similar to the plan proposed.

5. A county superintendent and at least one assistant county superintendent be retained, but be specially trained for their work and be required to spend a greater proportion of their time in careful supervision of the classroom work of the consolidated schools than is now possible under the present school organization.

6. All past and future bonded indebtedness and all future school operating and maintenance expense be pooled.

AN ETYMOLOGICAL STUDY OF CERTAIN PROFESSIONAL AND SCIENTIFIC TERMS IN THE VOCABULARY OF INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

Herbert Howard Hutchinson, B.Sc. in Edu.,
The Ohio State University, 1929

Department of Practical Arts and Vocational Education

The purposes of this study are: (1) to set up a master list of professional and scientific terms in these fields; (2)

to prepare an etymological glossary of these terms; and (3) to set up criteria for the selection of a suitable term.

The study was made as part of the Terminological Investigation of the Western Arts Association which is under the direction of Dr. William E. Warner of The Ohio State University.

The need for studies in terminology is shown by the confusion and variation in the usage of terms in this field for the last fifty years. Instances of this are cited as existing among the specialists, in the teacher-training institutions, in the names of associations, and in the names of magazines of this field. The empirical source of terms is discussed.

Criteria were set up, and by their use a master list of eight hundred and seventeen terms was selected from five distinct sources. Of this list, six hundred and seventy-five were included in the etymological glossary. The others, being word combinations, could not well be included.

The following techniques used in the word study are discussed in Chapter V: spelling; principles of arrangement; completeness of study; comments and suggestions; uncertain etymologies; quotations; recent word creations; the dictionary check; and methods of recording the findings.

Here is given an example of the way in which each word is listed in the etymological glossary:

SHOP, n. Old High German *scopt*, porch or vestibule; Middle low German *schoppe*, shed; Modern German *schopf*, lean-to type of structure, barn, porch; Old French *eschoppe*, booth; French *echoppe*, a tradesman's stall, a lean-to type of booth; English Dialect *shippen*, cow shed; a porch, barn, lean-to building, cow shed, booth, cobbler's stall. (Compare with Laboratory and decide which should be used.)

In Chapter VII is given a list of terms using the words: arts, industrial, manual, practical, training, and vocational. A list is also given of those terms referring to some type of general shop.

Certain groups of terms which are frequently misused are given in Chapter VIII. While it is true that many of these words do come close to others in meaning, it should be

remembered that "there is no such thing as an exact synonym." One of the groups listed is "connoisseur, authority, expert, genius"; another one is "example, project, exercise, model, experiment, operation, problem, unit, job." A list of criteria for the selection of a suitable term is given in the final chapter.

PUPIL TRANSPORTATION IN THE LOGAN COUNTY OHIO SCHOOL DISTRICT

Chester Smith Hutchison, B.Sc. in Agr.,
The Ohio State University, 1924

Department of School Administration

The present system of transportation of school children began in Logan County about the year 1915. Conditions have so changed that today every school district in the county has school children who are transported to and from school by some means. At present there are 15 separate systems operating independently in the county. Some are privately owned and so operated, while others are owned and managed by the boards of education. In some cases the clerk of the board and the superintendent of the school are directly responsible for the routing and governing of the system. There has been no endeavor to unite or adopt a uniform system throughout the county.

The cost of transportation varies considerably. It is shown that the school-owned buses alone are able to make an average of \$26.91 per child yearly, whereas the average cost of transportation for the county is \$33.72. In Logan County the highest cost of transportation was found in the system operated by the two brothers at Degraff. The following figures were taken from various reports in other localities showing the average pupil cost:

Logan County	\$33.72
Indiana	32.25
Utah	30.72
Ohio	25.80
Mississippi	12.64
North Carolina	12.24

It will be noted from the above figures that Logan County is spending considerably more than the average. This fact is due to the following variations:

1. Size of buses
2. Road conditions
3. Length of routes
4. Administration

One other condition which at first thought seemed to be influential was that of duplication of routes, that is, the covering of the same territory by two buses from different schools. The entire seven and one-half miles of duplication could be eliminated if a county system of transportation were instituted.

Everything else being equal, the larger the bus, the cheaper the transportation. The schools with an index higher than 100, hauled an average load of 23.5 pupils as compared with 30.7 for those schools with an index lower than 100.

The time consumed in transporting the children is not influenced by the index number, as the average in both cases is 38 minutes from the time the first child enters the bus until it arrives at the school building. A total of 3753 minutes were used to transport 2517 children 781.8 miles with 97 trips.

The fact that Bellefontaine is a railroad center necessitates a greater number of railroads passing through the county. There is a total of 94 crossings to be made by school buses twice each day. This condition requires careful routing and responsible drivers.

INDUSTRIAL ARTS IN THE SMALL HIGH SCHOOL: PROPOSAL
FOR INDUSTRIAL ARTS IN THE HIGH SCHOOL
AT HILLIARDS

Clark Lyman Jackson, B.S.,
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Department of Practical Arts and Vocational Education

This study was made with the objective of determining the scope and characteristics of industrial arts for the small high school.

A preliminary survey was made of all the small high schools in Franklin County, Ohio, in order to find out what was actually being offered in industrial arts courses. Following the survey, a representative school was chosen from the group and an intensive study made of it through personal interviews with school authorities, examinations of existing records, and data secured from pupils by means of a questionnaire.

Data furnished by the pupils gave the per cent of pupils expecting to graduate from high school, the courses offered and the per cent choosing each course, the per cent of pupils expecting to attend college, the choice of life occupation, the hobbies indulged in, the extra-curricular activities in which the pupils participated, the activities of the pupils during the vacation period, the part-time work carried on during the school year, the types of books and magazines read, and the occupations of father and mother.

In view of the fact that the community itself offered only a limited opportunity for participation in and observation of those life activities whereby the race is sustained, it would seem advisable that the industrial arts offering of the school should be such as to supplement and amplify that already available within the community. Hence an industrial arts offering organized about the general laboratories' plan would seem to be the logical recommendation.

Assuming the conditions at Hilliards to be typical of small high schools, we feel that the industrial arts offering for such a community should be such that the pupils would have opportunity to acquire a wide range of information and knowledge, rather than intensive information, and to develop some competency in a large number of skills, rather than a high degree of skill in a limited sphere. The following units are recommended: *a comprehensive* and *strong* home mechanics unit, a *general* woodworking unit, a *general* metals unit, a *general* drawing unit, an auto mechanics unit, a printing unit, and a ceramics unit.

It is recommended that for those pupils who leave school before graduation, provisions be made for vocational training through coöperative relations between the school and the industry.

A SURVEY OF THE HIGH-SCHOOL LIBRARIES OF FRANKLIN COUNTY, OHIO

John William Jones, A.B., B.S. in Edu.,
Park College, 1912
Ohio University, 1915

Department of School Administration

Introduction:

In the early days of secondary schools, educators believed in the efficacy of the textbook. Gradually there began to develop a different kind of classroom procedure. This change in method made insistent demands for more books for reference, and consequently the need for libraries began to develop in our high schools.

Purpose of the Study:

1. To show the importance of the high-school library.
2. To determine whether or not the libraries of Franklin County, Ohio, measure up to the standards of the American Library Association.

3. To make recommendations that will bring about a more successful library administration in the county

Sources of Material:

1. Ohio State Department of Education Principal's Report, Form 21
2. Local high-school courses of study
3. Annual financial reports of the County Auditor

Procedure:

The School Library Score Card of the American Library Association was used, and ratings were given by the author on each of fifty-nine items. These rating were tabulated in order to make comparisons with the American Library Association standards. Because of flagrant discrepancies between the reports as given by the principals and the reports of the County Auditor, it was necessary personally to count all the books in the twelve county high-school libraries.

Results as Revealed:

1. In every school, teachers in charge of libraries had neither training nor experience in library work.

2. Very little effort had been made to create either the library habit, a desire to supplement school work, or a desire to do home reading.

3. In a majority of cases the schools surpassed the standards on the number of books per pupil enrolled, which is five or more books per pupil.

4. Five schools exceeded the American Library Association standards as to expenditures; three made no expenditures whatsoever; and the remainder spent less than \$1.00 per pupil per year for books. No school had complete library records.

5. Library rooms are unattractive, poorly planned, and insufficiently equipped.

Recommendations:

1. All pupils should have ready access to books.

2. Teachers should have training along lines of library work.

3. More care should be exercised in planning the library room.

4. The Dewey Decimal System of Classification of books should be required and necessary records kept.

5. There should be a frequent check of libraries, and each school should be required to meet the American Library Association standards as to expenditures.

A POETIC INTERPRETATION OF REALITY

Edgar Boice Kellar, A.B.,
Marietta College, 1924

Department of English

Throughout the philosophical literature of the past there may be traced certain lines of thought that overlap one another and altogether converge to the one central point of the quest for Reality. The metaphysical-minded seek knowledge in mathematical terms of Oneness and Duality. Plato's philosophy is an attempt to view the real things in abstract terms called Universals. Things of the earth are mere reflections of real things.

The particular contribution of Christian mysticism was to instill a belief that man is capable of bringing himself into direct union with the Divine Reality. Poetical outbursts of pleading for this union are to be found in the writings of St. Thomas Aquinas.

Dante broke away from the mediaeval asceticism, by pointing the way to a universal brotherhood. Wordsworth and Keats aimed to preserve the faith in the unseen reality without renouncing the seen.

American transcendentalism became both mystical and idealistic. In the mind of Emerson it was mixed with the pantheistic doctrines of Tennyson and Wordsworth. Nature

was destined to exert its power, and with Emerson we have a more whole-hearted acceptance of the Universe, without being hounded by matter versus spirit.

Emerson was too sketchy. Thoreau brought him back to earth and confronted him with the essential goodness of the concrete.

Whitman accepted the "coarseness and sexuality of the earth," and challenged the philosophically inclined to prove that there ever were the two opposed forces of beauty and ugliness. Whitman would reduce everything to a common level.

John Burroughs cringed from the bolder attempts of Whitman but accepted the fundamental doctrine that ugliness and beauty were not real factors in our existence. He propounded a naturalistic faith in the essential goodness of the universe.

SOCIAL LIFE IN WASHINGTON AND RICHMOND, 1860-1865

Freda Mae Kennard, B.Sc. in Edu.,
The Ohio State University, 1925

Department of History

This thesis deals with the social side of the Civil War period and of the period just previous to the War, both in Washington and in Richmond. The latter part of the administration of President Buchanan, in all its social gayety, is first sketched in Chapter I. The leaders, both the Americans and the prominent members of the foreign legations, are mentioned. The place of Miss Harriet Lane, the niece of President Buchanan, as mistress of the White House, is described. The gayety of Buchanan's court wanes with the election of Abraham Lincoln, November, 1860. After the secession of South Carolina, the Southern element of society, which had hitherto played such an important part in Washington political and social life, departed from that city.

The second chapter has to do with life in Washington during the period from 1861-1865, when Mary Todd Lincoln was the center much criticism in her rôle as mistress of the White House. Southerners and Northerners alike criticized her because her relatives were fighting on the Confederate side. Her extravagance brought much criticism too. A brief sketch of her life is given in order to explain some of her attitudes towards various matters. The leaders of society, together with the types of amusement, especially the plays they enjoyed, are also mentioned, as well as the religious life of Civil-War Washington.

The final chapter describes social life in Richmond, the capital of the Confederacy. Varina Howell Davis, the wife of Jefferson Davis, the President of the Confederacy, here assumes a social leadership which Mrs. Lincoln never attained in Washington. Mrs. Davis' life is sketched, mention being made of her associates and friends who were social leaders of Richmond. The "starvation party" was the characteristic type of amusement here during the Civil War. Culture and fineness of character are evidenced in all Southern social groups. The influence of the military element on the society in both cities is shown.

Diaries, memoirs, newspapers, biographies, and general accounts of the period are the kinds of sources that have been used in gathering material for this thesis.

THE MINISTER AS PROTAGONIST: A STUDY IN NINETEENTH CENTURY FICTION

Frances Carol Kirkpatrick, B.A., B.Sc. in Jour.,
The Ohio State University, 1928

Department of English

In studying the motif of the minister, three novels have been chosen to show the conflict arising and the story pattern resulting when a minister becomes involved in a love

affair with a woman marriage to whom is not advisable, suitable, or possible.

An intensive study has been made of Nathaniel Hawthorne's *The Scarlet Letter*, James Matthew Barrie's *The Little Minister*, and Sir Arthur Quiller-Couch's *Ia*.

The novels have been analyzed for style, for setting, and for folk customs which make the peculiar development of each situation inevitable. The minor characters who help to fill the stage have been studied in detail, as well as the minister and the woman he loves.

The Scarlet Letter deals with the adulterous love of Hester Prynne and Arthur Dimmesdale. The story is of the lifetime of misery resulting from sin. The author cares not for the love story of Hester and the minister but only for the effect of their illicit relations.

The Little Minister does not swerve from the pattern of morality and respectability, although for a time it seems that the hero will depart from conventionality. But when "the Egyptian" is found to be a young English lady, the situation resolves itself into one capable of happy solution.

Study reveals that *Ia* is the best book of the three. It is the story of a tragic incident in the life of a Cornish girl who has fallen in love with "one who might become a very great man indeed" but who unselfishly takes the whole burden of the affair herself and permits Paul Heathcote to pass out of her life, in order that his future as a great minister may not be ruined by marriage to a Cornish fisherman's daughter, who is the mother of his child.

Ia is found to be a novel of great strength and beauty, both in its charm of setting and in its building of the exquisite character of the Cornish girl.

RAINFALL TYPES OF THE SOUTHEASTERN EVERGREEN FOREST

Gladys Virginia Kirsch, B.A.,
Ohio Wesleyan University, 1929

Department of Botany

This paper shows in a graphic way the distribution of rainfall from a periodicity standpoint, and correlates the rainfall types with the vegetation of the southeastern United States.

Rainfall over a period of eleven years is taken as a sample of monthly and annual distribution. The data obtained and plotted on polar charts indicate the following correlations:

1. The Long-leaf Pine forests are correlated with the larger amount of precipitation during the growing season (an average of 63 per cent) and the irregularity of seasonal distribution, with 22 per cent of the growing season showing insufficient rainfall.

2. The Short-leaf Pine forests correspond to decreased precipitation during the growing period (an average of 53 per cent) with the percentage of drought slightly higher, 25 per cent of the growing season showing insufficient precipitation.

3. The Strand vegetation correlates with a higher percentage of drought during the growing season, which averages 40 per cent of the period.

4. The Post Oak Savannah is the result of soil conditions, the underlying rock being a soft limestone. The rainfall type is the same as that found in the Short-leaf Pine Forest.

5. The Andropogon prairie corresponds with the highest variability of rainfall distribution, with an average of 30 per cent of the growing period showing insufficient rainfall. The average per cent of precipitation during the growing season is 55.

6. The vegetation of the desert grassland is correlated with the low annual precipitation and the high percentage

of drought during the growing season. Sixty-four per cent of the average annual precipitation of 25 inches falls during the growing period, and 40 per cent of the period has insufficient rainfall.

7. The semi-desert has the lowest rainfall of any region studied, averaging 9.3 inches, 55 per cent of which falls during the growing season. An average of 38 per cent of the period has insufficient precipitation.

8. The rainfall types are shown to be different for each of the vegetation areas.

DEVELOPMENT OF THE DUE PROCESS AND EQUAL PROTECTION CLAUSES OF THE FOURTEENTH AMENDMENT WITH SPECIAL REFERENCE TO LABOR DECISIONS

John Joseph Kleinfelter, A.B.,
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Department of History

The purpose of this study is to show the evolution that has taken place in the interpretation of the second sentence of section one of the Fourteenth Amendment, which reads, "No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any state deprive any person of life, liberty or property, without due process of law, nor deny to any person within its jurisdiction the equal protection of the law."

The work of the reconstruction committee is discussed, with particular emphasis on the leading opinions regarding the formation of the first section.

It is pointed out that during the years 1873-1880 the Supreme Court decided the noted Slaughter House and Granger Cases. In these cases the Court declared the Fourteenth Amendment was not intended to extend the federal

power in such a way as to interfere with the police power of the states, as long as the states were exercising the power for the health or welfare of their people.

During the eighties the Supreme Court developed what is commonly called the Doctrine of Judicial Review. This doctrine began with a series of rate-fixing cases and is further illustrated by six cases in which the Court refused to uphold the state statutes enacted for the benefit of labor. In these six cases the Court overrode the determination of the states that social and economic conditions demanded legislation. In deciding these cases, abstract legal concepts were relied upon almost exclusively.

In more recent years it has been the tendency of the Supreme Court to make a scientific study of cases. By the citation and review of sixty-four cases involving state labor statutes, it has been shown that the Court has acted favorably toward labor.

The present tendency of the Supreme Court is to take into consideration evidence, public opinion, and emergency legislation in rendering their decisions. Credit is given to Justices Holmes and Brandeis for being the leading exponents of these new doctrines.

In preparing this study, elaborate use has been made of the Supreme Court reports, supplemented by legal material and books dealing with this subject.

THE DICTION OF SENTIMENTAL DRAMA

Ruth Florence Knopf, B.A., B.Sc. in Edu.,
The Ohio State University, 1912

Department of English

It is our problem to note the changes in diction correlative to the thought of the eighteenth century. The drama is a fruitful field for the study of diction because it is of a par-

ticular time and for the time in which it is written. The playwright has ever in mind the jostling crowds of the pit and balconies.

In the history of the drama, an attempt to set distinct limits to various movements is not only futile, but actually misleading.

We find traces of the sentimental attitude appearing about 1675 and lending color to the diction while the Restoration type is yet in full swing.

The diction of Restoration drama is clear-cut and straightforward, full of wit and sharp repartee, and marked by baldness of language perfectly in keeping with the ideals of the times.

In Wycherley's *Plain Dealer* we find the diction noteworthy for its high restraint and the absence of the expression of emotion. In Congreve's *The Way of the World* we find the style playful, yet tender, with sentiment suggested rather than expressed. Wit and humor predominate, but there is a slight tendency toward a softening and humanizing of the expression.

In Restoration drama the motivation is objective, whereas in Sentimental drama it is subjective. The very vocabulary of sentimentalism is suited to the psychological function it is to perform, and deals not only with mental processes but also with their reaction on the outside world.

We find such expressions as "tender love," "gentle and kind reproof," "you've melted me," "blush," "joy," "embrace," "conversion," "dote," and "grieved." There is a tendency toward heightened exaggeration, as "*Best of fathers, believe me or you'll kill me.*" Repetition is a favorite trick of diction to secure emotional reaction, as, "I cannot, cannot hurt her." Under the stress of passion the diction becomes highly metrical and often falls into the rhythm of blank verse. Restraint has vanished by the time of Cibber and Steele, and verbose declarations of feeling are popular. The moralizing tone established by Steele's plays sets the model for the next fifty years.

Mrs. Centlivre's diction excels in lively dialogue full of sparkle and individuality.

The early tragedy of the century follows the models of Marlowe and Shakespeare in the use of stately blank verse. The introduction of domestic tragedy, however, tends to simplify diction, reducing it to the plane of humble life. Tragedy, losing the splendor of court life, begins to rely upon "horror" for attraction. We find the diction full of epithets like "monster," "villain," and "wretch."

Kelly shows a tendency to be introspective, and his diction is marked by such phrases as "doesn't know her own mind," and "the sober reflections and scrutinizings into the mind of a lover."

Goldsmith and Sheridan show a distinct humanizing tendency. Their diction is noteworthy for its perfect naturalness and for its effective simplicity. There is a flexibility of style which enables them to portray varied characters with sympathetic understanding. Both have a genuine sense of humor and are able to capture moods and feelings that are elusive to many playwrights.

At the end of the century we leave diction a more versatile tool in the hands of the dramatist, by means of which he is able to reproduce *living* characters. The clanging sophistry of wit and wooden artificiality have disappeared.

THE RESURRECTION OF LAZARUS IN THE LUCERNE PASSION AND OTHER PASSION PLAYS OF MEDIEVAL GERMANY

Frederic Jacques Kramer, B.S. in Edu.,
Miami University, 1928

Department of German

The chief purpose of this investigation has been to establish the text of the Lazarus scene of the Lucerne Passion Play of 1545. The work has been done by means of photostatic reproduction of the original manuscript, which is located in the Bürgerbibliothek, Lucerne, Switzerland.

It has been believed for some time that the Lucerne Passion Play and the Donaueschingen Play, the latter first edited by Mone in his *Schauspiele des Mittelalters*, are closely related, both, in all probability, developing from an older play. Careful comparison of the Lazarus scene substantiates this view, and indicates that the Lucerne version of 1545 has been revised and enlarged by constant recourse to the Biblical source.

Numerous other passion plays of medieval Germany have been examined for textual or structural similarities to the Donaueschingen-Lucerne group, but all show distinctly that there can be no historical relationship except, of course, such as follows from the fact that all passion plays were ultimately derived from the Vulgate.

The Lazarus scene as found in the Lucerne and Donaueschingen plays is in reality a composite of four loosely connected episodes in the Life of Christ: (1) the death and awakening of Lazarus; (2) the debate between Christ and the Jews; (3) the council of the Pharisees; and (4) the supper at the home of Lazarus. These are discussed in the treatment of the historical development of the scene. References to the Biblical sources, the variant readings for the Lucerne versions of 1597 and 1616 and Donaueschingen are contained in the Notes following the text.

The manuscript, copied by Zacharias Bletz, Stadtschreiber of Lucerne, is written in Latin rather than in Gothic script. The handwriting is regular and very legible, obviously the work of an exacting scribe. Examination of the phonological, morphological, and syntactical aspects of the language reveals that it is essentially pure Middle High German, the *Kanzleisprache* of Lucerne for the middle of the sixteenth century, with but few traces of the *Mundart*. In the breakdown of the older, fuller inflectional endings, however, there is a strong resemblance to New High German.

THE NORWOOD LAW AND ITS EFFECT UPON THE PENAL PROBLEM IN OHIO

Samuel Aaron Kramer, B.S. in Edu.,
Temple University, 1929

Department of Sociology

Section 2166 of the General Code of Ohio, known since its last amendment of March 15, 1921, as the Norwood Law, gives judges the power to fix any minimum of a general sentence to the penitentiary for any felony except treason and murder in the first degree, provided that he does not set it lower than the minimum nor as high as the maximum fixed by law for each crime. A study of the commitments to the institution from January 1, 1927, to December 31, 1927 (except for those receiving a penalty of death or life imprisonment, to which cases this law does not apply) demonstrated how this law works in actual practice. By means of a statistical analysis, it was shown that there are almost as many different systems of justice in Ohio as there are judges. Some are characteristically and consistently severe; others are unchangeably lenient; while many admitted, in their letters, that they are prejudiced against certain crimes, or that they have no means of determining the type of sentence to be imposed. The Norwood Law is found to be a cause for the fact that the penitentiary is being overcrowded more rapidly than the other penal institutions of the state. Also, it secures more drastic punishments toward negro criminals than toward whites; it causes first offenders to be more heavily sentenced than recidivists, without proper reasons; it results in great inequality and injustice in sentencing; and because of it, judges become addicted to the habit of giving sentences in multiples of five years. During the research it was also found that many of the courts are pronouncing absolutely illegal sentences, due to an indiscriminate use of the power conferred by this statute.

Therefore, it is recommended that Section 2166 of the

General Code as it is now found to operate, should be repealed, and for it should be substituted a purely indeterminate sentence law whereby each convict would be sentenced with a minimum of no days and a maximum of life imprisonment. If this is impossible, there should be a return to the law not permitting the court to change the statutory sentence. A capable parole board and state-wide system of adequate parole must be established, not on a political or elective basis. In addition, judges should be so selected that they will be capable of separating the important facts from the unimportant, and of directing the trial in such a manner as to bring out all possible relevant material.

THE OPERATION OF THE OHIO COMPULSORY-EDUCATION LAW IN MEDINA COUNTY

Harry Earl Kuntz, B.A., B.D.,
North-Central College, 1917
Evangelical Theological Seminary, 1919

Department of School Administration

This study is a part of a general investigation of the operation of the Ohio Compulsory Education Law in three cities and nine counties of the State. Dr. Arch O. Heck of The Ohio State University directed the study. Field men of the Child Labor Committee of New York City made the investigation in the cities. A volunteer committee of graduate students conducted the county surveys.

The thesis is a report of the study of the employed and the idle children fourteen to eighteen years of age residing in the school districts under the jurisdiction of the Superintendent of Schools of Medina County. The two exempted village districts of Medina Village and Wadsworth are not included in the investigation.

A personal visit was made to the home of each employed or idle child in the county. Prepared forms were used to record the information secured.

The data secured during the interviews are analyzed to determine:

1. The size of family as a factor in elimination from school
2. Home conditions as factors in elimination from school
3. Sex as a factor of school elimination
4. The school history and attitude of those who have left school
5. Employment possibilities for pupils leaving school in Medina County
6. The degree of violation of the certification provisions of the law

Also to determine the extent of the problem aroused by the seventh-grade requirement for certification for employment, an age-grade study is made of all the pupils fourteen to eighteen years of age enrolled in the Medina County Schools. So few are found to be sixteen years of age or over and enrolled in the seventh grade or below, that the seventh-grade requirement for certification does not constitute a problem in this county.

The picture in Medina County is not disheartening. The youth of the county recognizes that its place is in school. Only a few have withdrawn. Part of these have withdrawn legally. With but little effort, the remainder could be persuaded to obey the law or to remain in school. The enforcement of the Compulsory-Education Law could be made complete and effective without hardship to anyone.

JUSTUS JONAS

John Ohlinger Lang, A.B.,
Capital University, 1926

Department of History

The purpose of this thesis is to present the relation of Justus Jonas to the Lutheran Reformation in the sixteenth century. My interest in the Reformation period as well as my interest in the study of personalities led to the choice of the subject.

Inasmuch as a knowledge of the events of Jonas' life is necessary in order to understand his place in history, and inasmuch as there are no biographies of him in English, I have devoted my first chapter to an account of his life.

In the second chapter I endeavor to show that during his early career at Erfurt, Jonas was a humanist and had great admiration for Erasmus. However, when at the Diet of Worms in 1521 Jonas became definitely associated with Luther's movement, he, like the reformer, broke with the great humanist because of the mildness of his policy and had nothing but words of contempt for him.

In my third chapter I have aimed to show the important relation which Jonas bore to the Augsburg Confession. He was a member of the committee to draft the Torgau Articles, which became the basis for the part of the Confession dealing with the abuses in the Roman Church to which the Lutherans objected. Jonas accompanied Melanchthon and the others to Augsburg and was the only theologian present during the reading of the Confession. It was Jonas who kept Luther informed concerning the developments at the diet, and it was Jonas who, to a certain extent, upheld Luther's position at Augsburg against the compromising tendencies of Melanchthon. Finally, it was Jonas who in 1533 first advocated that all candidates for the Lutheran ministry subscribe to this Confession as a guarantee to the authorities that they would preach Lutheran doctrine.

The fourth chapter is an attempt to show that Jonas, who began as a professor of canon law and who was, no doubt, well versed in the Roman Catholic teaching concerning the celibacy of the priesthood, became, after his conversion to Lutheranism, a strong advocate of the marriage of priests, and exemplified his doctrine himself by entering three times into the estate of matrimony.

Jonas' conception of the Church is the subject of the last chapter. During his early career he accepted the Roman view of the Church as a sort of political hierarchy, but later developed the idea of the Church as essentially invisible, consisting of all true believers. However, he soon discovered that this invisible Church must have some kind of a visible organization, and thus he developed the idea of the consistory, which became the model for the organization of the Lutheran Church in Germany for many years.

SOME LESIONS ASSOCIATED WITH PARALYSIS

Aubrey Mac Lee, D.V.M.,
Kansas State Agricultural College, 1922

Department of Veterinary Pathology

Paralysis of the legs in fowls is a rather common and important condition, and has been considered by many workers to be a distinct disease. Various names, such as fowl paralysis, range paralysis, neuritis, and neurolymphomatosis gallinarum, have been advanced for this condition.

In this work studies were made upon forty-seven cases of paralysis, forty being chickens from twenty-seven flocks, five, dogs, and two, sheep. The dogs and sheep were used for comparison with the fowls. The principal studies were made of the nervous tissues and the intestines. The outstanding anatomical pathological findings in the fowls were: catarrhal enteritis, enlargement of the peripheral nerves,

and whitish opaque appearance of the eyeball. The only consistent microscopical finding was severe catarrhal enteritis with extensive desquamation of the epithelium of the intestines. Some of the other common microscopical findings were: lymphocytic infiltration and edema of the sciatic nerves, median nerves, brachial plexus, posterior spinal nerve roots and gangliae; lymphocytic infiltration, principally perivascular, of the cerebrum, cerebellum, medulla, pons, optic lobe, optic nerve at entrance to retina, iris, and ciliary body; and fatty degeneration of the enlarged nerves by Marchi's Method and also by staining frozen sections with Sudan III.

Coccidia were found in twenty-four of the fowls but not in the dogs and sheep. Tapeworms as well as other parasites were found in a number of the paralysis cases.

The dogs and sheep also showed severe catarrhal enteritis, and infiltrations of lymphocytes in the cerebrospinal nervous system. There were no infiltrations in the peripheral nerves.

It appears that fowl paralysis is not a specific disease but is the result of catarrhal enteritis with extensive desquamation of the epithelium of the villi of the intestines, and subsequent absorption of toxic products from the digestive tract. Coccidiosis, intestinal parasites, and dietary disorders are the most common causes of catarrhal enteritis.

RAINFALL TYPES IN RELATION TO NATURAL VEGETATION

Mary Margaret Leonard, A.B.,
Marietta College, 1925

Department of Botany

The influence of humidity and precipitation upon plant distribution has long been recognized. The relation between the variability of monthly and annual precipitation and the

distribution of prairie and the northeastern forest types is shown in this paper by a series of graphs.

Nineteen stations representative of the prairie and the deciduous and northeastern coniferous forests were chosen as sources of data. The amounts of rainfall for the various months of the years 1910 to 1920, inclusive, were taken as samples of the monthly distribution of rainfall for each of these regions.

A polar chart with twelve coördinates, each coördinate representing a month of the year, was used in plotting a graph of the precipitation rates of each year. Each division of the coördinate represents an inch of rainfall. Nineteen plates were made, consisting of rainfall charts of eleven successive years and a twelfth chart, the mean for the particular station.

The treeless condition of the prairie may be partly explained by the seasonal distribution of rainfall. Seventy per cent of the rain falls from May to September, inclusive. Droughts occurred during these years in approximately 43 per cent of the growing season. This frequency of drought and exposure of the prairie to conditions favoring rapid evaporation and desiccation—strong winds and intense sunlight—are influential factors.

The deciduous forest is distinguished by the following climaxes: oak-hickory, beech-maple, pine-hemlock-beech-maple, and chestnut-oak. These forests are characteristic of regions of little variability in monthly rainfall and of a uniform seasonal distribution of rainfall. Approximately 50 per cent of the precipitation falls during the growing season. Droughts occur only during 21.7 per cent of the growing season.

The northeastern coniferous forest is mostly composed of white pine, red pine, and jack pine with scatterings of spruce fir. In this region most of the winter precipitation falls as snow, and droughts occur most frequently in the months of May, June, and July. The annual amount of rainfall is nearly the same as in the deciduous area, but droughts are approximately twice as frequent, that is, they occur during 38 per cent of the growing season.

THE PROGRESS MADE BY LIBERIA FROM 1847 TO 1900

William Henry Lewis, B.A.,
Wilberforce College, 1924

Department of History

The purpose of the thesis is to give a general view of the history of Liberia, the Negro Republic of West Africa, from its inception up to 1900. The major problems which faced the Republic and the ways they were met by the various administrations of the period are pointed out to show the progress that was made in the form of territorial expansion, political and economic development, growth of population, and awakening of a national consciousness on the part of both the foreign-born element of the population and the natives of the hinterland.

The manuscript is divided into nine chapters, each of which, excluding the first and ninth, deals with distinctive phases of the history and problems of the period under consideration. Chapter I, which is introductory, is descriptive, dealing with the location of Liberia, the coast line, area, climate, geographic features, population, and native groups.

Chapter II traces the origin of the Republic and deals with its history and problems during its colonial period, from 1820 to 1847. In this chapter it is pointed out that Liberia was founded by the American Colonization Society with the assistance of the United States government as an asylum for freed American negroes. It was under the direct supervision of these agencies until 1847, in which year it was forced to declare its independence in order that it might obtain the proper respect for its commercial, political, and territorial rights from the nations of the civilized world.

Chapter III deals with the government of Liberia and the administration of the first President, Joseph Jenkins Roberts, from 1847 to 1856. The functions of the three departments into which the government is divided are discussed and the duties of the various constitutional officers explained

and contrasted with the duties of similar constitutional officers in the United States. The rise of the early political parties is treated, and the major problems which confronted the Republic during the year 1847-1856 are pointed out. It is shown how the Roberts' administration met these problems.

Chapter IV deals with the administrations of the next two Presidents of the Republic, Stephen A. Benson and Daniel B. Warner, from 1856 to 1868. During this period the territory of the Republic was greatly increased by the annexation of the independent colony of Maryland, and the authority of the Liberian government was extended over many of the natives who lived in the present boundaries of the country.

Chapter V covers the administrations of Presidents James S. Payne, Edward J. Roye, Joseph J. Roberts, Anthony W. Gardner, and Hilary Richard Wright Johnson, from 1868 to 1892. During this period the country was involved in troubles with England and with the late German Empire, which threatened its independence; an unfortunate loan was made, the interior of the country penetrated, and the authority of the government further extended over the natives living in the hinterland.

Chapter VI sets forth the aggression of France on Liberian territory, thus indicating the territorial problems which the Republic has had with European nations. It also reveals the reaction of the country to foreign aggression and shows the indifferent attitude which the civilized nations of the world had towards aggressions, even though unmerited, upon the territorial, economic, and political rights of a government carried on by men of the negro race for people of that race.

Chapter VII traces the economic progress that was made during the period. The problems of pioneer life, the African palm, the First National Fair of the country, trade, and commerce are discussed.

Chapter VIII sets forth the influence of the church upon the development of the country. The work of the various

church denominations operating in the country during the period is discussed and its influence and contributions to the political, economic, and educational development of the country pointed out.

Chapter IX is a general summary of the facts set forth in the thesis.

There are three appendices at the end of the manuscript. Appendix A is the Constitution of Liberia; appendix B is the national anthem of Liberia; and appendix C contains the names of the Presidents of the Republic from 1847 to 1902.

THE RELATION OF MITOSIS AND CELL ENLARGEMENT TO THE GROWTH OF LEAVES

Liang Ching Li, B.S.,
Nankai University, 1927

Department of Botany

This paper is based upon the study of a six-months continuous collection (February to July, 1930) of the young buds, mature opening buds, and mature leaves of the following six plants of Ohio:

1. *Aesculus glabra* Willd.
2. *Aesculus hippocastanum* L.
3. *Liriodendron tulipifera* L.
4. *Rhododendron maximum* L.
5. *Salix nigra* Marsh.
6. *Syringa vulgaris* L.

This material was prepared by the paraffin method—sectioned and stained. A total number of more than 1500 prepared slides were made.

Many sections of the young leaves of *Aesculus glabra*, *Aesculus hippocastanum*, *Liriodendron tulipifera*, and *Sy-*

ringa vulgaris showed mitotic figures, proving that there is cell division as well as cell enlargement concerned in the development of the young leaves of these plants. In the other two plants, *Rhododendron maximum* and *Salix nigra* no cell division was observed. Possibly this was due to the fact that the cells were very small and contained dense cytoplasm and inclusions which seemed to make good preparations difficult to obtain. It seems quite likely, however, that mitotic figures will be discovered in these species upon the improvement of the technique.

Owing to the tremendous extension or enlargement of cells of the upper and lower epidermal layers, and little change of size in the mesophyll tissue, the air spaces within the mesophyll tissue must be consequently formed by the cells being mechanically pulled apart.

It seems evident that during the unfolding of leaves from buds in spring we have most of the elongation or enlargement taking place in epidermal layers and most of the cell divisions in the mesophyll cells. Any condition limiting elongation or enlargement of the epidermal cells, such as high transpiration, would limit the leaf size. This will explain the difference in size of shade and sun leaves.

Evidence is presented showing that of the six species under investigation, two of them, *Aesculus glabra* and *Aesculus hippocastanum*, have all the leaves formed in the bud before the bud opens in spring. The remaining four species appeared to produce new leaves after opening of the bud.

STATE TEACHERS' ASSOCIATION OFFICERS, THEIR POWERS AND DUTIES

Howard Gordon Lindemann, Ph.B.,
Denison University, 1922

Department of School Administration

Purpose:

This study presents an analysis of state teachers' association officers with particular emphasis upon their powers and duties.

Materials:

The sources of the data presented are: forty-three association constitutions and by-laws; twenty-six replies to a questionnaire sent to thirty-five association secretaries requesting their opinions on present types of organization; and thirty-two replies to a personal data questionnaire sent to all secretaries. Supplementary sources were association journals and miscellaneous publications.

Procedure:

All data in the constitutions and by-laws pertaining to the association officers were arranged in frequency tables which are presented and accompanied by summary tables. All data of the questionnaires were subjected to statistical treatment.

Conclusions and Comments:

Over 65 per cent of the association secretaries consider the delegate assembly type of state organization, which works with and through local associations, to be the best type as judged by principles of democracy, efficiency, continuity of policy, and member participation.

Little agreement exists among association constitutions upon the composition of the executive staff; except that in all cases the president is a member. The president's duties are varied and numerous, and pertain principally to his office, to his capacity as a presiding officer, to association conventions, to committees, and to district or local association affairs. The frequent inclusion of the retired president as a member on the executive committee indicates a tendency to capitalize his past experience.

The vice-president and treasurer have but few important duties; these duties relate principally to their office. It is recommended that they be given greater responsibilities, thereby relieving the president and secretary of many details.

Over 65 per cent of the associations use the title, "executive committee," for their chief managerial body. The members in approximately three-fourths of the states are

selected by the delegate assembly. The terms of the elected members do not expire concurrently, except those of association officers who are included in the membership. The order of frequency with which its principal classes of duties are mentioned in the constitutions is: duties pertaining to association officers; to the annual meeting; to finances; to district or local associations; to the committee itself or duties of its individual members; and to general management and records. Indefinite statement of duties and divided responsibility are errors frequently found.

The important officer usually known as secretary is appointed by the executive committee in twenty-seven of the forty-three associations. In twenty states he is appointed for a term of one year. He is usually reëlected for a three-year term; only five secretaries are on tenure. Over 85 per cent are college graduates with a median of 9.4 years of experience as school superintendents. They receive a median salary of \$5,042, and have a median length of service in their present positions of six and one-half years. Their duties are so manifold that no general classification is possible. Their most frequent achievement in office is "increased membership."

Association constitutions would be more often read by the members if larger type were used. Powers and duties of the officers should be stated with greater clarity, and should be more definitely assigned.

OUTSIDE PRESSURE ON THE TEACHING OF HISTORY IN THE STATE OF OHIO

Edith Anna Longbon, Ph.B.,
Denison University, 1924

Department of History

This study was aimed to cover the teaching experience of the members of the teaching profession who coöperated by helping to furnish information. The scope was limited

to the secondary schools. Approach to the work was made by searching for pressures which may have been exerted by certain organizations or in certain situations. The information and the data were gathered from: (1) replies to questionnaires directed to superintendents, principals, and high-school history teachers; (2) correspondence and interview with the proper representatives of the Ohio branch of the organizations noted above, and in many cases a search of their records and reports in addition; (3) a search of Ohio and other educational magazines, publications touching the teaching of history in the public schools, and certain school legislation.

Tables are used to assist in setting forth the amount and the quality of pressure noted on the questionnaires. The discussion of the same is organized according to the suggested sources of pressure in the order in which they appeared on the questionnaire. The information secured from the representatives of the suggested sources is set forth in a similar manner. Further indications and data from miscellaneous sources conclude the information.

It is found that there has been some pressure recognized by the teaching profession in this period. The sources, listed by more than 15 per cent of the total number of persons who reported, were (in descending order), The American Legion, The Grand Army of the Republic, Ku Klux Klan, Women's Christian Temperance Union, Book Companies, Certain Individuals, Editors, Parent-Teacher Associations, and Anti-Saloon League. A total of 301 cases were listed from all sources named.

In the main, the pressure found was of a patriotic nature. There probably was further pressure which was too subtle to be detected.

THE STATUS OF CLERICAL SERVICE IN OHIO SCHOOLS

Raymond Lewis Lorton, A.B.,
Oberlin College, 1916

Department of School Administration

Purposes of the Study:

A problem quite perplexing to most school administrators and teachers is how to handle satisfactorily the ever increasing clerical duties that are necessary, and still meet the growing exactions of administration, supervision, and teaching. It is the purpose of this study (1) to show the present practices in handling the clerical work in the schools of Ohio, and (2) to show the efficiency of the various methods used.

Procedure:

A rather extensive questionnaire was used to secure the necessary data for the study. It was sent to fifty-two exempted village superintendents, one hundred and seventy-six superintendents and principals in the county systems, eighty-one small city high-school principals, and fifty heads of science departments in city systems. Sixty-seven and one-tenth per cent of the questionnaires were returned. The information obtained from them is given in tabular form, with explanations.

Findings:

While fifty-two and one-tenth per cent of the schools reported some form of clerical service, it is available mainly for the executive heads of the large schools. The service is not extended to the teachers nor to the supervisors, and many times it is not available to principals. Most schools under county supervision have no clerical assistants. The traditional method of requiring administrators and teachers to crowd clerical duties into their daily programs of supervision or teaching in the interests of economy, is costing four and one-half times as much as is necessary.

Recommendations:

It is recommended that all clerical duties that do not require the services of a teacher or administrator should be delegated to clerical assistants. To insure careful and efficient administration of the work, it should be carefully supervised in a central clerical department.

It is further recommended that clerical assistants be provided in the following ratio: one full-time clerk for all schools requiring not less than a superintendent, a principal, and eight teachers; one full-time clerk for all high schools requiring not less than a principal and ten teachers; and part-time clerks for smaller schools.

ERRORS IN LONG DIVISION

Oakman Hess Lowary, A.B.,
Cornell University, 1902

Department of School Administration

This thesis was based upon the errors made on weekly test papers by children in the 4A grade at Parmelee School, Youngstown. The study was carried on during three semesters with three different groups of children taught by two different teachers. The total enrollment for the three classes was 95.

The test papers were marked by the teacher and then handed over to the principal, who analyzed the errors and classified them. This was followed by a conference between the principal and the children making errors.

Fifty-six types of errors were recognized in the first classification. Many of these were similar, and later all were combined into eleven unrelated groups. The following table gives these groups, the total frequencies in each group for all three classes, and the per cents these totals are of the whole number of errors.

Errors	Frequencies	Per Cent
Multiplication	370	23.27
Subtraction	358	22.51
Remainder too large	167	10.50
Product too large	161	10.12
Finding quotient	155	9.75
Bringing down	97	6.15
Zero quotient	93	5.84
Copying numbers	80	5.03
Making example come out even.....	70	4.40
Miscellaneous	23	1.43
Product misplaced	16	1.00
Totals.....	1,590	100.00

When these errors are divided into those in fundamental operations and those in technical long division processes, each group forms approximately 50 per cent of the whole number.

The major causes assigned for these errors were: incomplete knowledge of fundamental combinations and operations, weakness in ability to adapt knowledge of and skill in fundamentals to a complicated process such as long division, limited mental ability of some children, carelessness, and lack of concentration.

The studies, by revealing that 50 per cent of the errors arose from faulty knowledge of fundamentals, suggested that more thorough preparation be given in these. Several forms of drill were devised to aid the children in adapting their present skills to the requirements of long division. The study suggested that whatever could be done to hold children's undivided attention upon their work and cause them to apply constantly checks which were a part of the methods of procedure would materially reduce these errors.

Probably the greatest benefit to be derived from a study of this kind is the clear-cut picture it gives of the work of both the group and the individual pupil. Such a picture always furnishes the necessary basis for remedying the individual's faults, which in the final analysis is the purpose for which the study was organized.

A SALARY SCHEDULE FOR CLERKS OF BOARDS OF EDUCATION
IN STATE AID RURAL AND VILLAGE SCHOOL
DISTRICTS OF OHIO

John De Walt Macklin, B.S. in Agr.,
The Ohio State University, 1917

Department of School Administration

The statutes of the state of Ohio delegate to boards of education the authority to employ clerks to record the proceedings and to transact business authorized by the boards and to determine the compensation for said clerks. In the absence of a salary schedule for clerks of boards of education, the range in compensation voted by different boards for clerks having approximately the same duties is likely to be considerable. In those school districts which habitually look to the State for financial aid, the disbursements are carefully regulated, and expenditures are required to be charged to specified funds. In some instances several accounts are carried in a common fund. The clerk's salary, for example, must be paid from the contingent fund, which also includes all supplies and personal service other than transportation. It is obvious that if the clerk's salary is disproportionately large, other beneficiaries in that fund will be unduly restricted. This study is intended to set up a salary schedule that will reduce the range in salaries for clerks in districts of a given size, and thereby prevent overpayment of the clerk to the detriment of the several accounts in the contingent fund.

Procedure:

The statutes of other states were consulted to secure suggestions of methods in effect in those states tending to regulate the clerks' salaries. These findings were tabulated for convenient reference. The Auditors' Reports, 1929, to the Director of Education, state of Ohio, furnished data on the salary of the clerk and his total disbursement, for each rural and village school district in the State. The ratio

between each salary and total disbursement, in terms of per cent, was determined. These per cents were tabulated to show the central tendency, mode, median and frequency. The duties of the clerk were analyzed objectively and each unit duty assigned a money value. A questionnaire was sent to selected clerks in Ohio, requesting a return on these duties for a normal year, 1928, a building-program year, 1929, and the first half of 1930. The data thus assembled show the increase in the duties that a clerk might anticipate during a building program, and indicate the increase in salary to which he is entitled for such increase in duties.

Findings and Recommendation:

The range in salaries paid clerks of boards of education in Ohio is considerable, even in districts of similar size. The several states vary widely in their methods of compensating such clerks, the majority following the practice now in effect in Ohio. Results of the questionnaire indicate that the duties of the clerk during a building program may be expected to increase on the average, about 38 per cent. The recommended salary schedule follows:

Total Disbursement	Maximum Salary Per Year
\$ 2,500 or less.....	\$ 25
2,501-\$20,000.....	1 per cent of total disbursements
20,001 or more.....	\$200, plus $\frac{3}{4}$ per cent of disbursement in excess of \$20,000

NOTE: (a) The salary for a given year is to be based on the total disbursement (less capital outlays) of the preceding calendar year; (b) for a year in which a building program will be undertaken, necessitating a disbursement exceeding that on which the salary is to be calculated by at least $33\frac{1}{3}$ per cent, the salary may be increased to 38 per cent.

AN INTERPRETATION OF THE LIFE AND POETRY OF
COATES KINNEY

Debora Mary MacNeilan, B.A., B.Sc. in Edu.,
The Ohio State University, 1914, 1917

Department of English

This thesis is an interpretation of the life of the Ohio poet, Coates Kinney, as that life bears upon his poetry.

Most of the facts which comprise the life were found in the poet's unpublished autobiographies and letters, and in an unpublished manuscript, the revision of the chapter on Coates Kinney in William Henry Venable's *Beginnings of Literary Culture in the Ohio Valley*.

It was Mr. Emerson Venable, literary executor and friend of Coates Kinney, who permitted me to come to his father's study and there collect the material from which the thesis is written. Other facts were found in the poet's essays and poetry published in newspapers, magazines, and books in the library of the Ohio State Historical Society.

I have attempted to show that the events of Coates Kinney's life determined the nature of his poetry. His great theme was immortality, which he takes from the world of mythology and places in the realm of science. He is a great poet because in his poetical flights of imagination he carries Man far beyond his ordinary range of thinking. His stanzas are singing and easily quotable.

Because his great theme is death, his poetry has a melancholy tone which is kept sweet by the voice of hope singing throughout, now faintly, now triumphantly.

For many years Coates Kinney was famous the country over as author of the touching poem "Rain on the Roof." But he has written many more beautiful lyrics in his three books, *Keeuka and Other Poems*, 1855; *Lyrics of the Ideal and the Real*, 1887; *Mists of Fire*, 1899. While to the past he has been endeared for his lyric "Rain on the Roof," to future generations, trained in scientific thinking, he will be known for his masterpiece "Mists of Fire."

"Mists of Fire" is a trilogy composed of the poems "Kapnisma," "Pessim and Optim," and "A Keen Swift Spirit." "Kapnisma," the greatest poem of all he produced, has for its philosophy evolutionary pantheism. As the soul of the universe, God is in all and every part; all things are one and the one is God. God evolves worlds and various forms of life until he reaches the sovereign consciousness, Man, whose selfhood, working up through myriad degrees and capable of infinite expansion, is absorbed ultimately in the one consciousness—Universal Memory.

MUSCULAR EFFICIENCY OF WOMEN

Helen Marie Manahan, B.Sc. in Edu.,
The Ohio State University, 1929

Department of Physiology

In January, 1930, an investigation was begun to determine the muscular efficiency of women. Thirty-five satisfactory tests on twenty-one college women were obtained. Ten of the subjects were physical education majors, five were in a physical education class for overweight women, and the other six were average college women who were used as controls. When two or more tests were run on the same subject, the efficiency did not deviate much, providing that the conditions remained the same. The lowest deviation between tests was .20 per cent. The average deviation for duplicate tests, irrespective of conditions, was 2.30 per cent.

The subjects were tested in the morning while in a post-absorptive condition. Each test consisted of a rest period of ten minutes, an exercise period of five minutes duration, and two recovery periods each six minutes in length. Two Tissot spirometers were used in the collection and measurement of the expired air and the Haldane apparatus used in the analysis of the air. A bicycle ergometer of the Prony Brake type was used for the exercise period.

The results obtained from the efficiency tests justify the drawing of the following conclusions.

The muscular efficiency ranged from 18.39 per cent to 28.42 per cent. The physical education majors showed the highest average muscular efficiency, their average being 23.25 per cent. The controls showed an average of 22.14 per cent while the overweight group stood lowest with an average of 21.94 per cent. The slight difference in efficiency between the three groups is probably not significant.

The overweight group showed the lowest respiratory quotients for exercise, first and second recovery periods. The quotients for these periods were respectively .869, .887, and .872. The control group had the highest quotients for these same periods, the quotient for exercise being .923. For the first recovery period the quotient was .991 and for the second recovery period the quotient was .898. The lowest quotient for the rest period was shown by the control group with a quotient of .836.

During exercise three tests showed a respiratory quotient above 1.0, while in the first recovery period there were sixteen out of the thirty-five tests which had a quotient exceeding 1.0. The average respiratory quotient for excess metabolism of all groups was 0.998, while in fifteen cases it was in excess of 1.0. This high respiratory quotient for the excess metabolism apparently indicates a preference of muscle tissue for carbohydrate fuel.

During work the respiration rate increased 214 per cent for the physical education majors with 23 per cent increase in the per cent of O_2 absorbed, while the control group showed an increase in respiration rate of 261 per cent with an increase of only 18 per cent in the per cent of O_2 absorbed. The overweight women showed the greatest percentage of O_2 absorbed with the smallest increase in rate of respiration. Their respiration rate increased only 207 per cent, while their percentage of O_2 absorbed increased 22 per cent.

The control group did the greatest amount of work, with a total of 5.62 Calories while the overweight group worked the least, their work amounting to 4.21 Calories.

There was no relationship between the body weight and efficiency, likewise there was no relationship between the respiratory quotient and the efficiency.

A HEALTH PROGRAM FOR THE SCHOOLS OF FAIRVIEW
VILLAGE, CUYAHOGA COUNTY, OHIO

Lewis Frederick Mayer, B.A.,
The College of Wooster, 1920

Department of School Administration

In this thesis the writer attempts to take a complete health program—the one suggested by Dr. Frederick Rand Rogers, Director of the Health and Physical Education Division of the New York State Department of Education—and apply it to the health situation in the schools of Fairview Village, Cuyahoga County, Ohio. The purpose is to see how far the present program in Fairview is measuring up to the standard set by Dr. Rogers, what should be done to make it conform to that program, and what part of the program, if any, should not be attempted.

Dr. Rogers' program is briefly outlined in the first chapter. The second chapter shows what health work is being done in Fairview by agencies outside the schools. These agencies are the Parent-Teacher Association and the County Board of Health. Chapters III, IV, and V deal with the various divisions of Dr. Rogers' program as they are carried out in the schools. These divisions are Health Protection, Health Teaching, and Health Development. It is shown that in general health protection and health teaching are being well taken care of in Fairview, while health development is not well cared for at the present time. Chapter VI is devoted to phases of the program which need attention. a more hygienic school program, reclassification of pupils Among these may be mentioned need for a full-time nurse,

in high school for physical education, and mental hygiene. Chapter VII presents a list of recommendations for improving the health situation in Fairview, using Dr. Rogers' program as a basis.

POSSIBLE ECONOMIES IN A COUNTY ADMINISTRATION OF SCHOOLS

Edward Earl McClelland, B.S. in Edu., A.B.,
Miami University, 1920, 1921

Department of School Administration

The purpose of this study was to determine the possible economies in a county administration of rural and village schools in Ohio. The first part of the study estimates the financial economies which would result from the elimination of local boards without otherwise changing the internal organization and districts of the county. The second part treats of economies which would probably result from reorganization and redistricting under complete county administration. The study was based upon the expenditures for school purposes of the twenty-two districts of Montgomery County, Ohio. This county was selected as a typical county as to number of local boards, rural and urban territory, and its advocacy of the county unit of taxation for school purposes.

From the financial reports of the clerks of boards of education, from statistical data in the office of the county superintendent of schools, and from other miscellaneous sources, the following items were ascertained for the various districts and for the entire county:

1. Expenditures for salaries of board members, clerks, drivers, janitors, and enumerators
2. Expenditures for administrative, educational, janitor, transportation, and miscellaneous supplies, also fuel, maintenance, and capital outlay

3. Per pupil costs of several of these

The chief financial economies and advantages determined were:

1. An estimated savings of \$31,555.80, or 22.5 per cent, upon twelve selected items now costing \$140,573.86

2. Large additional economies in maintenance, capital outlay, and miscellaneous items, discussed but not definitely determined

3. Elimination of local clerks, with employment of a county business manager and assistant with resultant economy of \$3,000

4. Better personnel in boards of education

5. More efficient business administration

The chief economies and advantages in the second part of the study resulted from:

1. Consolidation of rural schools

2. Merging of small high schools

3. Relieving crowded conditions in buildings by changing boundary lines

4. A logical system of county transportation not limited by arbitrary district lines

5. Elimination of local superintendents, with substitution of assistant county supervisors, resulting in large financial economies and a more unified system

6. Equalization of educational opportunity, with a county uniform tax for school purposes.

A STUDY IN IMMUNITY OR RESISTANCE TO
Ascaridia lineata (SCHNEIDER)

Bryce R. McCrory, D.V.M.,
State Agricultural College of Colorado, 1927

Department of Veterinary Pathology

An experiment with 144 chickens was carried out to ascertain if the administration of an extract of the nematode

Ascaridia lineata (Schneider) would increase the resistance of chickens to this parasite.

Chicks, reared in confinement, were separated in three groups according to age, each group containing forty-eight birds. These groups were further divided into three lots of sixteen birds each. All were kept under the same condition with the following exception: One lot of each group were given extract, prepared from *Ascaridia lineata*, and approximately five hundred embryonated ova from this parasite. Another lot of each group were given ova only, while the third lot received neither extract nor ova and were kept as controls.

The weight of each bird was taken at the commencement and termination of the experiment and the average gain per bird was ascertained. A record was kept of the amount of feed consumed by each lot from the date of parasitizing to the close of the experiment. The birds were autopsied at the end of three weeks and examined for parasites. The number of worms found and their average length were recorded and a comparison made in each lot.

At the close of the experiment the greatest variation in the average gain per bird was found in the young birds of Group A. The normal controls made the greatest gain, while the lot given extract and ova made a much greater gain than the lot receiving only ova. In Group B, the same ratio existed but the difference was not so marked. The birds in Group C showed very little difference in the three lots.

A greater variation in the average amount of feed consumed was observed in Group A, in which the parasitized birds consumed less than the normal controls. Much the same results were observed in Group B, while in Group C very little difference was noted.

An enteritis was present in a majority of the birds in Lot 2, Group A, which received only embryonated ova, while in Lot 1, which received extract and ova, only a small number showed this condition and it was of a milder type. In Lots 1 and 2, Group B, similar results were observed, but

there were not so many affected as in Group A. In Group C, this factor was not significant. All control birds were negative to this condition.

The birds in Lot 1, Group A (extract and ova) contained a larger number of worms than was found in Lot 2 which received only ova, and the average length was about the same in each lot. There was no significant difference between these two lots in Groups B and C.

A SURVEY OF THE FLY POPULATION OF THE OHIO STATE
UNIVERSITY CAMPUS WITH ESPECIAL REFERENCE TO
Musca domestica

Marian Valora Antoinette McIlhenny, B.A.,
The Ohio State University, 1929

Department of Zoölogy and Entomology

In order to determine the species of flies commonly found on The Ohio State University campus, collections were made regularly from traps placed at various stations in or near the University buildings.

Two separate collections were made: the first from September 17, 1929, until December 10, 1929; the second from July 2, 1930, until July 30, 1930.

In collection I, 989 flies were caught, of which 971 were *Musca domestica*, 10 *Lucilia caesar*, 4 *Calliphora erythrocephala*, 2 *Homalomyia canicularis*, 1 *Stomoxys calcitrans*, 1 *Muscina stabulans*.

In collection II, 2094 flies were caught, of which 1315 were *Musca domestica*, 547 *Stomoxys calcitrans*, 142 *Lucilia caesar*, 84 *Calliphora erythrocephala*, 4 *Homalomyia canicularis*, 1 *Sarcophaga sarraceniae*, 1 unidentified *Tachina*.

Of all the flies collected 74.15 per cent were *Musca domestica*, 25.85 per cent being made up of all the other species, which were divided as follows: 17.78 per cent *Stomoxys*

cal'citrans; 2.85 per cent *Calliphora erythrocephala*; 4.93 per cent *Lucilia caesar*; 20 per cent *Homalomyia canicularis*; .03 per cent *Muscina stabulans*; .03 per cent *Sarcophaga sarraceniae*; and .03 per cent *Tachina* sp.

The chief breeding place for flies on the campus is in piles of straw in the Botanical gardens behind the Horticulture and Forestry building. It is suggested that these be controlled by burning the straw, by drying it out, or by placing it on a rack over a receptacle containing water.

THE NEGRO IN THE ANTISLAVERY MOVEMENT

William James Flournoy Meredith, B.A.,
Fisk University, 1926

Department of History

The purpose of this study is to show that the Negro did not stand idle while the whites championed his cause for freedom, and that with the aid of the Negro the whites were able to carry on the antislavery agitation more successfully. The thesis for the most part treats of the lives and works of individual Negroes in the antislavery movement. It is developed under the following heads: First Period of Antislavery Agitation; The Convention Movement Among Negroes; Negro Insurrectionists; Negro Oratory; The Underground Railroad; The Negro Woman in the Antislavery Movement; and The Greatest Negro Antislavery Worker—Frédéric Douglass.

The first period of antislavery agitation has to do with the events and happenings for or against the antislavery cause before the entry of William Lloyd Garrison into the struggle. Among the things considered are: the fact that many Negroes fought in the Revolutionary War expecting freedom as a reward when peace was declared (the majority of whom were disappointed, especially those who fought in the British army); the gradual emancipation policy in the

North; and the freedom with which abolition sentiment was expressed in the South.

The convention movement among Negroes began in 1830. The purpose was to get Negroes interested in agitating for the cause of freedom, and to change by intelligent lecturing throughout that section the "photograph" that many of the whites in the North had of the free Negro.

The Negro insurrectionists played an important rôle in this huge drama. Three stand out conspicuously. They are: Gabriel, who threatened to destroy Richmond, Va., about 1800; Denmark Vesey, who planned a similar feat against Charleston, S. C., in 1822; and Nat Turner, who in 1831 started his famous massacre in Virginia. In the John Brown raid of 1859 quite a few Negroes took part. A monument in Oberlin's cemetery commemorates the three Oberlin Negroes who lost their lives as a result of the raid.

The colored orator wrought a notable change in public sentiment during the dark days of slavery. Quite often he was more readily received than his "white brothers" with whom he was coöperating. Of this group, Sojourner Truth, Frederick Douglass, and Francis Watkins Harper were quite prominent. The first two traveled extensively in the interest of the slave. Douglass even traveled abroad, lecturing in Great Britain and Ireland. Francis Watkins Harper in addition to lecturing wrote several poems which had an effect upon the mothers of the North similar to that created by *Uncle Tom's Cabin*.

In many instances the underground railroad would have been unsuccessful without the aid of the Negro. One of the most important "cogs" in this "machine" was William Still of Philadelphia whose book *The Underground Railroad* contains many letters from fugitives to show what a vital factor he was in the system. Levi Coffin in his *Reminiscences* gives several accounts of the heroism of Negroes in the underground railroad rescues. One of his most famous is the story of Louis Talbert. Of all those aiding fugitives to freedom no one stands higher in the cause than Harriet Tubman, who made possible the escape of over three hun-

dred. Although herself a fugitive slave, she very often went into slave territory to get her "fellow bondsmen" and to make sure that they were on the road to freedom.

A number of Negro newspapers owned and operated by Negroes were used in the antislavery agitation. The most outstanding was the *North Star* later changed to *Frederick Douglass' Paper* and edited by him in Rochester, N. Y.

THE EDUCATIONAL RESEARCH ACTIVITIES OF THE STATE OF OHIO

Homer Earl Mikesell, A.B.,
Ohio Northern University, 1925

Department of Political Science

In making this study the author has two objects in view: (1) to present a clear picture of the agencies, methods, and results of educational research as it is now conducted by agencies of the government of Ohio, and (2) to suggest ways and means for the improvement of the administration of this important function. Material for this study was secured by personal interview with those in charge of educational research activities, and by reference to current research publications.

In the introductory chapter an attempt is made to define research. The purpose and methods of the study are explained, and the field to be covered is indicated.

In the second part of the thesis the work of the Bureau of Educational Research of the State Department of Education is described. The study shows that thus far the work of this new agency has been of real value, but that more assistance and better organization are needed. Other agencies such as the Ohio Institute and the Ohio Educational Association which coöperate with the Bureau are briefly described.

In the third chapter the content, methods, and results of

the Every Pupil Tests of the State Department of Education are described in some detail.

The fourth chapter discusses the educational research activities of various staff members of the Department of Education who are not directly associated with the Bureau of Educational Research. It is shown that almost all of the staff of the department do some work involving research of one type or other. The accomplishment of staff members whose work is primarily of the nature of research is described.

In the fifth chapter the work of The Ohio State University Bureau of Educational Research is described. Its size, organization, and the extent of its work are contrasted with those of the bureau of the State Department of Education.

The concluding chapter offers suggestions for the improvement of the educational research facilities of the Department of Education. Inclusion within the bureau of all staff officials of the State Department whose work is primarily in the field of educational research is recommended. The following present staff officers of the Department of Education should be included within the Bureau of Educational Research as heads of sections: supervisor of scholarship contests, director of child accounting, director of special classes, consultant in special education, and possibly the auditor and rehabilitation surveyor.

CAUSES OF ELIMINATION IN THE JUNIOR HIGH SCHOOLS OF HUNTINGTON, WEST VIRGINIA

Joseph Randolph Miller, B.S.,
Otterbein College, 1914

Department of School Administration

The purpose of this thesis is to determine:

1. The causes of withdrawals in the junior high schools of Huntington and the relation of causes to age, grade, and sex.

2. The relation between the occupation of the parent and the rate of elimination

3. The relation, if any, existing between intelligence and elimination

4. The significance of the so-called economic pressure

5. The number and causes of reëntries, also the success attained upon reëntry

The study shows that of the 879 cases considered, 465 or 52.9 per cent were boys and 414 or 47 per cent were girls. Moving from the city was given as the cause of withdrawal by the greatest number of students. Illness came second as a cause, followed closely in third position by the necessity of pupils going to work. The greatest number of withdrawals occurs in the fifteenth year, this being the age at which the compulsory-education law releases its hold.

Except for reasons of moving away and illness, both of which are beyond the control of the student, very few students on the A level of intelligence withdraw from school. A very marked increase in the number of withdrawals on the B level was found, and a much greater number still on the C level. The record of retardation and acceleration reveals the fact that 38.1 per cent of all withdrawals were retarded, the extent of retardation being from one to seven semesters. The records show also that only 3.5 per cent of withdrawals were accelerated.

The study reveals that by far the majority of all withdrawals come from the homes of the laboring class. Ninety-three per cent of the total were listed in the three labor occupations. Only 1.6 per cent were listed as coming from the homes of the professional class and 4.8 per cent from the proprietary class. The Huntington Junior High Schools are selective to a very marked degree, catering to pupils of highest intelligence and from the better class of homes.

Reëntries, except where withdrawal was due to illness, are exceptions rather than the rule. Even in this case, failure results more frequently than success. Retardation

usually leads to withdrawal, whether caused by illness or lack of ability.

The records pertaining to granting work permits were poorly kept. Indications pointed to a general laxness in the administering of permits. The department was undermanned and received poor coöperation from employers of labor. A small increase in expenditure here would result in savings to the community, in a better trained citizenry.

The study was handicapped by the failure of teachers to record important items listed on the permanent record card. The following recommendations are made in the belief that greater attention to a few details will result in better information for similar studies and greater persistency in school: (1) that particular attention be given to the keeping of records; (2) that the program of studies be enriched so as to provide a greater variety of vocational work; and (3) that the work in the fundamental subjects be outlined on A, B, and C levels of intelligence, so that students of low intelligence may be given equal chance with those on the higher level for achieving success.

A CONSOLIDATED SCHOOL DISTRICT FOR SOUTHWESTERN ATHENS COUNTY

Laud Francis Miller, B.S. in Edu.,
Ohio University, 1923

Department of School Administration

The problem in this investigation was to determine, if possible, the feasibility of the formation of a new district, the way in which this territory might be consolidated, the best location for the building, the kind and size of building needed, and the number and location of bus routes.

The procedure followed was, first, to secure from the records of the office of the county superintendent of schools

such facts as enrollment by grades, pupil-teacher costs, school population trends, teachers' qualifications, and teacher turnover. The second source of information was obtained through a questionnaire which was filled out by the pupils in the schools through the help of the teachers in charge. This questionnaire considered the economic, social, and educational centers of the district. The third source of information was from the county auditor, the county surveyor, and the United States census supervisor. Certain data were also obtained from the clerks of the boards of education of the districts involved. The final step was a comparison of the financial obligations of the old and new districts, *i.e.*, the three existing systems and the proposed new unit.

The study has shown that it is possible to consolidate the most of these schools at the present time, with the possibility of extending the program to include all of them within a very few years; that consolidation should take place at Albany; and that the cost of operation of the new unit will be considerably more than the operation of the one-room schools.

The following recommendations were made:

1. That the county board of education create a new school district by virtue of the power vested in it by section 4737 G.C., and appoint a board of education for the new district.
2. That the newly appointed board of education submit a bond issue of \$75,000 at the next regular election for the purpose of erecting a school building at Albany to accommodate the pupils of junior- and senior-high-school age.
2. That the present building at Albany be used to house the pupils of the first six grades.
4. That certain remaining territory of Alexander Township be transferred to Lodi Township.
5. That the Center Stake, Chase, Golden, Hebbardsville, Lookout, and Townhouse schools be brought in to the consolidated school as soon as the new building is completed.

6. That the Fairview, Jolly, and Brooks schools be continued until such time as it is possible to haul the pupils attending these schools by motor bus.

7. That the present one-room school buildings be advertised for sale as soon as they are not needed for school purposes.

CIVIC EDUCATION IN GRADES FOUR TO SIX

Margaret Elizabeth Monroe, B.Sc. in Edu.,
The Ohio State University, 1928

Department of Principles of Education

This thesis was written for the purpose of evaluating programs of Civic Education in the light of progressive theory. An analysis was made of a number of courses of study now in use in order to determine their points of strength and of weakness, and to discover the extent to which they satisfy the present need for a program of civic education.

Chapter I is given to a consideration of the theory of civic education as expressed in the general writings of Bobbitt, Snedden, Horn, and Charters, and that implied by the modern philosophy of education. The acceptance of this latter theory involves a new sort of program. The criteria for judging, stated and developed in Chapter II, are derived from the guiding principles of this progressive theory. The courses of study evaluated in Chapter III were chosen to represent various types of programs. Chapter IV deals with the type of civic education found in activity schools as demonstrated by The Ohio State University Summer Demonstration School for June and July, 1930.

The courses of study examined are directed toward many goals and contain numerous procedures for attaining their purposes. In some, moral qualities are stressed, in others, social and civic attitudes receive emphasis; in some the indi-

vidual child and his interests are the center of education, while in others, the society and its standards are placed first; in some, courses are organized around problem solving, while others are arranged to foster habit formation. Among the seven courses chosen for judging, there are only two—the Denver and the Rugg courses—which provide opportunity for individual expression through social living. The course formulated by Rugg and Krueger and the activity program are the only plans which approximate the ideal, as measured by the criteria in Chapter II.

From this study evolves an idea of the inadequacy of present civic education programs, and a realization of the need for courses of study which are so planned as to contribute to the child's ability to grow through intelligent adjustment of his own interests in relation to society.

PRINCIPAL METHODS OF COLLECTING THE DATA IN RURAL SOCIOLOGY

Hubert Montagnac

Department of Rural Economics

This short study is a critical analysis of the most important methods of research offered to the student of Rural Sociology. The historical method of research is the first step in an accurate examination of the sources available concerning the special question considered.

The case work was historically the first method of observation, but it requires a skilled worker and previous knowledge of the environment. The statistical method is a complete enumeration. The most important inconveniences of this work are high cost and the difficulty in covering at the same time a large area.

The survey is the most usual way of investigating a limited area in a reasonable time and at a cost available to a private agency.

Taking or sampling a typical example at random are the two ways of procedure. Selecting a typical example, the social worker can expect to cover a certain area with help of statistics and without losing the accuracy and detailed interest characteristic of the case work.

All the methods are helpful at different degrees and all can be used successfully.

A STUDY OF THE DEVELOPMENT OF MATHEMATICAL CONCEPTS OF ARITHMETIC, ALGEBRA, AND PLANE GEOMETRY

Wilbert Swan Moore, B.S.,
Mt. Union College, 1928

Department of Psychology

A study was made of the development of mathematical concepts in arithmetic, algebra, and plane geometry using three objective tests on the technical vocabulary of these subjects. These tests were assembled and revised by Drs. S. L. and L. C. Pressey. The tests were given in grades 3, 5, 7, 9, and 11; the arithmetic test being given in all five grades and the algebra and plane geometry tests in grades 7, 9, and 11.

The results were studied under three divisions: (1) the degree of mastery of the essential vocabulary shown by each pupil; (2) the growth of each of the 243 concepts; and (3) the listing of concepts according to the degree of mastery.

It was found that the average mastery in arithmetic for the last two years of the study was fairly high, the per cent of the median of the total number of concepts for ninth grade being 84 per cent and that for eleventh grade 83 per cent. The average mastery in algebra was low, the per cent of the median of the total number of concepts being for ninth grade 45 per cent and that for eleventh grade 27 per

cent. The average mastery in plane geometry is higher than that in algebra but not so high as in arithmetic, the per cent of the median of the total number of concepts for ninth grade being 27 per cent and that for eleventh grade 52 per cent.

It was found that the rate of growth of the concepts is as a rule much the same. That is, there is a regular increase until they reach the seventh or ninth grades, where they often begin to drop to some extent through the eleventh grade. These results may be explained on the basis of loss of memory due to lack of use of these concepts. However, in the case of concepts more frequently used in everyday life, it was found that the increase in mastery continued on through the eleventh grade. A few learning curves showed a loss in the ninth grade and an increase in the eleventh.

The number of items out of the total of 243 that are mastered by 95 per cent or more of the students in the last two years of the study is only thirty-six. Eighty-eight were known by less than half of the students.

The results seem to indicate that there is a need for objective tests in the field of technical vocabulary of mathematics which may be used by the teacher as a means of determining which words of the essential vocabulary are understood when the pupil enters the course. The teaching of the subject could then be organized around the fundamental concepts.

Tables showing the degree of mastery of the essential vocabulary by each student, the growth of each concept from grade to grade, the concepts listed according to their degree of mastery, and graphs showing the learning curve for each concept are given in the thesis.

A BRIEF HISTORY OF THE OSAGE INDIANS

Helen Lucile Morley, B.A.,
The College of Wooster, 1927

Department of History

The Wa-zha-zhe tribe of American Indians, better known as the Osage, belongs to the great Siouan Group that in pre-Columbian days dwelt on the Atlantic coast. Frequent migration Westward occurred, and the first historical notice of them, which is Marquette's autograph map of 1673, locates them on the Osage River.

It was in this section of the country that they made their early contacts and treaties with the whites. Possessed formerly of a fierce and war-like spirit, they were gradually reduced by poverty, sloth, and their white environment to less than one-fourth of their number at the beginning of the nineteenth century.

Like most Indian tribes the migrations of the Osage from their seat where first encountered by whites coincide with the western trend of population and settlement. In 1825 they ceded by treaty to the United States their title right and interest to land in Missouri and Arkansas, and were given in exchange a large reservation in Kansas.

Immediately following the Civil War there was a rush of settlers to the rich farm lands of Kansas. These settlers demanded the Osage lands for themselves, and, after eking out a precarious living here for some time, brought such pressure to bear that Congress authorized the sale of Osage holdings, some five million acres, and the expenditure of as much of the proceeds of the sale as might be necessary in the purchase of a new reservation for them in what was then Indian Territory.

In 1872 the Osage were located on their present reservation, a little tract of land now co-extensive with Osage County, Oklahoma. They were grouped around the small town of Pawhuska. For a time the wolf of famine lurked

around their tepees. Then one day oil was discovered and the fortunes of the tribe were reversed.

In 1906 an agreement was made that the mineral rights should be reserved for the tribe as a whole, only the surface of the land going into individual ownership. Wealth in a constantly increasing stream has been inundating them ever since.

On the whole the influence of sudden riches has been very bad. There are notable exceptions, but in most cases the easily gained money has been a curse. The unsophisticated tribesmen have been ready victims of unscrupulous whites, and the exploitations of these Indians have been notorious.

The history of the Osage tribe is an absorbing study to one who takes an interest in tracing the effects of the ironical touches of the hand of fate on human lives and destinies. Such a study as this thesis makes it evident that the Osage Indians have been indeed the Chosen People of Chance.

THE ANGLO-RUSSIAN AGREEMENT OF 1907 IN PERSIA AFGHANISTAN, AND TIBET

William Herbert Morris, B.S. in Edu.,
Ohio University, 1925

Department of History

The purpose of this study has been to show the various points of friction between England and Russia which delayed the coming of the *entente*. This has been done by the aid of recent material, as for example: The English War documents, memoirs, letters, and biographies. Working in conjunction with these, the writer used certain Russian, German, and French opinions concerning the Agreement.

Signs of a *rapprochement* appeared at the Algeciras Conference, when Russia voted against Germany in favor of France. From this point an attempt has been made to show the rapid successive steps involved in bringing Russia closer to England, under the guidance of Izvolsky and Sir Edward

Grey; and to show how the age-long controversy over Persia and the Gulf was finally settled, including the arrangements concerning Afghanistan and Tibet.

Since the latter two were of minor consequence in the whole arrangement, the writer has given more time to the outcome of the settlement regarding Persia. It has been shown that the Bagdad Railroad and Straits questions were considered, but were set aside in order not to destroy the agreement; that Grey held a friendly and sympathetic attitude toward Russia's ambition to acquire a warm-water port; that this attitude of his seemed to have contributed largely in the matter of making concessions to the Russians, which brought considerable protest from the opposition in England; that the English Foreign Office was determined to bring about an agreement for the protection of India and to lessen the military tension with Russia; that England viewed the situation as a whole and was not willing to gamble away the long-sought-for opportunity because of matters which appeared to the treaty makers to be of secondary importance.

In addition to the original aim and purpose, the writer has attempted to show that Russia had a definite plan regarding the Straits question. Sir Edward Grey insists in his *Twenty-Five Years*, and at other times, that Russia never had a plan to submit for the settlement of the question of the Straits; that she was unprepared to submit proposals on the question when the Powers met in 1908 to settle this troublesome issue.

CONRAD'S USE OF AUTOBIOGRAPHICAL MATERIAL IN HIS SHORT STORIES AND NOVELS

Herbert Eugene Muntz, B.A.,
The Ohio State University, 1929

Department of English

Conrad limited himself almost entirely in his reminiscences to the years (1874-1894) that he spent on the sea,

and he chose from his own experiences those situations that initiated him into a new phase of life or served as a crisis in testing his character, situations similar to those in which he placed his fictional heroes.

Conrad's choice of material is closely connected with his theory of art. The writer's duty is to create a world in which he can honestly believe, to remain hopeful, and to pay respect to the humble virtues of man. This demanded that Conrad choose mainly reminiscences of the sea. The artist's primary purpose is to bring truth to light, and he must descend within himself to find the nature of his appeal to others' emotions. So he found autobiographical events of constant value.

Conrad usually had at least one of the following purposes in telling each of his personal experiences: to suggest a universal experience as in *The Shadow Line*, representing the first great responsibility that initiates youth into manhood; or to create a lyrical effect as in *Youth*, a mood "of wistful regret, of reminiscent tenderness"; or simply to give greater reality to strange events by putting them into a background of personal experience as in *The Secret Sharer* and in *Falk*.

All stories containing personal experiences are told in the first person, are singularly direct in narration, the events being given in practically chronological order; and, being fiction, each story allows Conrad to tell reminiscences of real narrative value in a form that permits changes to produce greater artistic effects. "Heart of Darkness" and "Youth," generally recognized as Conrad's best short stories, are both autobiographical, representing his most successful combinations of personal experience with fiction.

THE GEOLOGY OF THE CUMBERLAND (OHIO) REGION

Robert Henry Nesbitt, B.A.,
Muskingum College, 1928

Department of Geology

This report treats of the geology of an area around Cumberland, Guernsey County, Ohio. The study deals primarily with the stratigraphy of the region, but includes also a treatment of the physiography and the economic geology.

The major portion of the district is drained by the tributaries of Wills Creek, a branch of the Muskingum drainage system, while a small part in the southeastern corner is drained by the West Fork of Duck Creek which goes southward direct to the Ohio River. The topography is in the early maturity stage of the erosion cycle, having an average relief of about two hundred feet. There is an accordance of the general summit levels at an elevation of about 1,040 feet above sea level representing the Worthington peneplain. Above this a few isolated hills rise to a higher level, the Harrisburg peneplain. Below the Worthington is another level represented by flat spurs projecting into the main valleys. This is the Parkers Strath level and has an elevation of about 940 feet. These erosion levels range in age from late Mesozoic to late Tertiary time. The principal valleys of the area, Yoker Creek and Buffalo Fork, are filled to a depth of 30 feet with aggraded material deposited in late Tertiary time.

The rocks underlying the district belong to the Pennsylvania system, which is represented by two formations, the Conemaugh and Monongahela. In this region the total thickness of the exposed units of these formations is about 380 feet. These formations in eastern Ohio consist of many rock units called members; twenty of these named members have been identified in the field and are described in detail in this report. These members consist of shales, sandstones, red clays, limestones of marine and freshwater ori-

gin, and coal beds, as shown by the numerous sections in the report.

The principal coal horizons of the region are the Anderson coal, which has a workable thickness averaging 2 feet, and the Meigs Creek coal with a thickness of about 4 feet. A shale unit which occupies the interval between the Portersville shale and the Ewing limestone is used extensively near Glenwood for the manufacture of a high-grade brick.

THE IZVOLSKY-GREY PROGRAM FOR A EUROPEAN
CONFERENCE, 1908-1909

Edgar Burkhardt Nixon, A.B.,
Miami University, 1927

Department of History

The Izvolsky-Grey conference program was presented as a solution of the problems arising from the annexation of Bosnia and Herzegovina by Austria-Hungary. This thesis traces the development of the conference plan from its inception in October, 1908, to its ultimate failure in March, 1909. An explanation is offered of the motives leading Izvolsky to demand a conference, of the factors contributing to the failure of the conference plan, and of the circumstances surrounding Izvolsky's acceptance of the German counter-proposal.

This has involved a study of the previous history of the annexation, the problems arising therefrom, and the conflict in interests which forced the abandonment of the conference idea. The sources used include the diplomatic correspondence of the European cabinets of the period as presented in: *Die Grosse Politik, Osterreich-Ungarns Aussenpolitik*, *The British Documents on the Origins of the War*, and the Russian correspondence as translated and edited by Siebert and Schreiner.

On the basis of these materials, the writer has attempted to show that:

1. Izvolsky offered to support the annexation of Bosnia and Herzegovina, on condition that Austria support in return a Russian project having for its purpose the opening of the Straits to Russian warships. The negotiations preliminary to the agreement were carried on by Aehrenthal and Izvolsky during the spring and summer of 1908, and were consummated at a meeting in Buchlau, Austria, September 15, 1908. At this time, Izvolsky gave his consent to the annexation on the terms indicated and was given definite information as to the date of the event.

2. The annexation was not entirely motivated by Austrian imperialistic designs on the Balkans, but was precipitated by the circumstances induced by the Young Turk revolution, and by the Greater Serbia propaganda which had for its end the separation of the occupied provinces from Austria-Hungary.

3. The conference was proposed by Izvolsky in an effort to secure his part of the *quid pro quo* agreed upon at Buchlau, that is, the opening of the Straits. When this was denied him by the British Cabinet, he urged the conference as a means of securing indemnity, territorial and otherwise, for Serbia and Montenegro. He was impelled to this demand by a desire to punish Austria for having allegedly prematurely declared the annexation, by a desire to retain for Russia her rôle of the guardian of the Slavic interests, and by a desire to maintain his own political prestige.

The conference program was rejected by Austria and Germany because Izvolsky insisted upon including in the program his demands for territorial compensation for Serbia and Montenegro, and for the free discussion of the annexation of the Powers. An additional factor contributing to the failure of the plan was the fear on the part of Austria and Germany that they would be over-ruled by the other Powers, and that Austria would be arraigned for her violation of the Treaty of Berlin.

5. Izvolsky's final acceptance of the German proposal for a ratification of the annexation by an exchange of notes was secured by Bülow, not by threat of war, as was claimed by the former, but by a threat to permit the publication of the Austro-Russian correspondence in which the Russian consent to the annexation had been given.

THE LORD'S SUPPER SCENE IN THE LUCERNE PASSION PLAY OF 1545

Reinhold Louis William Nordsieck, A.B.,
Butler University, 1929

Department of German

The text of the Lord's Supper Scene in the Lucerne Passion Play of 1545 was transcribed from photostatic reproductions of the manuscript. The text thus established was compared with the 1597 and 1616 versions of the same passion play and with the Donaueschingen Passion Play. This comparison proved that, as far as this scene is concerned, the plays of Donaueschingen and Lucerne had a common ancestry. Certain rearrangements and additions were made in the various plays, especially in the Lucerne versions of 1597 and 1616. A comparison of these texts with the Vulgate showed that the authors and editors of these plays had borrowed heavily from this source. A good deal of expansion and arrangement was, however, necessary in order to cast this material into the desired dramatic form.

The whole scene was compared with its counterparts in the other principal German passion plays of medieval times. The earlier passion plays—those of Vienna, Benediktbeuren, and St. Gall, for instance—were constructed primarily upon the liturgy of the Medieval Church. The text of this scene in the later and longer passion plays, especially in those of Lucerne and Donaueschingen, were based

almost entirely upon the Vulgate, which offered their authors a great deal of hitherto unused material. Liturgical tags, which were still frequent in the plays of Frankfurt and Alsfeld, disappeared entirely with one possible exception, from the Lucerne and Donaueschingen plays. On the whole the Lord's Supper Scene in the Lucerne plays, especially in the version of 1597 and 1616, was developed to a much greater extent than in any of the other plays discussed.

The language of the piece was also investigated. Phonological, morphological, and syntactical aspects were noted. On the whole the language of the Lucerne Passion Play of 1545 did not differ greatly from literary Middle High German. Only in certain phonological tendencies and in the breakdown of certain inflectional endings of the noun, adjective, and verb were deviations observed. To be more exact, the language of the play was the official language or *Kanzleisprache* of Lucerne about the year 1545 in contradistinction to the popular dialect or *Mundart* of the same age.

THE NEGRO IN NATIONAL POLITICS SINCE 1868

William Felbert Nowlin, A.B.,
Howard University, 1919

Department of Political Science

The object of this study is to discover the activities of the Negro in Congress, in the National Conventions, the National Campaigns, and in the federal administrations. It aims also to point out certain political ideas and factors which have contributed to the advancement of the Negro in national politics since 1868.

The early negro Congressmen promoted legislation for civil rights, federal aid for education, and local improvements. The present negro Congressman, Oscar DePriest

of Chicago, has urged the investigation of conditions in Haiti, in addition to the appointing of colored men to Annapolis and West Point.

Negroes in the Republican National Conventions advocated remedial legislation, opposed the reduction of delegates, served as members of important committees, including the National Committee.

In the national campaigns Negroes dissatisfied with the attitude of the Republican party have gone over to other parties.

This study shows that under recent national administrations the Negro failed to receive appointments formerly his, such as Minister to Haiti, Register of the Treasury, and certain Consulships to Brazil, Russia, and Nicaragua.

The Negro's present position as a balance of power in several northern states bespeaks much for his future in National politics.

Three programs for the advancement of the Negro in National politics are mentioned. Emphasis, however, is placed upon the importance of a well-balanced, comprehensive program for his future, depending largely upon the leadership of the National Association for the Advancement of Colored People.

EFFECT OF DIFFERENT RANGES OF WAVE LENGTHS OF LIGHT ON THE PHOTOTROPISM OF THE HYPOCOTYL OF THE SUNFLOWER

Mary Winifred O'Connor, B.A., B.S. in E.,
College of St. Mary's of the Springs, 1929

Department of Botany

This work was done to show the effects of various ranges of wave lengths of light upon the phototropism of the hypocotyl of the sunflower. The results of this investigation

indicate that in general the short wave lengths of visible light are more effective than the long wave lengths. There is evidently a critical point in the effectiveness of light in causing bending, at a wave length of approximately 500 millimicrons. As long as the incident light includes wave lengths below this critical point a relatively high percentage of bending occurs; otherwise the amount of bending is relatively low.

Variations in light intensity had a minor effect in these experiments. The amount of phototropism was found to be nearly as high in cloudy weather as when the sun was shining. No correlation was found between the amount of energy transmitted by the glass plates used and the per cent of phototropism. Independent experiments on the effect of various light intensities showed that differences in light intensity greater than the range of intensities transmitted by the plates used had little or no effect on the percentage of plants showing phototropism.

Some bending took place independently of light, and this is probably a case of circumnutation. The evidence shows, however, that this type of bending seldom occurs under conditions of unilateral illumination unless the intensity of the incident light is very low, and therefore it could not be an important source of error in these experiments.

PUPIL ADJUSTMENT

Wilbur Edward Orcutt, B.S.,
The College of Wooster, 1919

Department of School Administration

In any modern school system which provides for the individual differences of pupils through curricular variations, there will be found a number of pupils whose abnormal physical, mental, or moral development is too great to fit

them into any one group. In order to give such pupils more adequate preparation, we assigned them to a counselor for the purpose of making case studies.

Our study included the following four types of maladjustment: (1) social maladjustment; (2) maladjustment because of a lack of incentive and interest; (3) normal and abnormal intelligence and low scholastic achievement; (4) low intelligence level and low scholastic achievement.

In our study the data collected were classified under the following headings: Personal Data; Family History; Personal Characteristics and Habits; Environment; Behavior when Alone; Behavior with Others; Ambitions; Attitude toward Teachers; Attitude toward Other Children; Attitude of Other Children toward Him; Comments of Previous Teachers; Results of Special Tests; and Psychological Findings. To these were added the personal findings of the counselor through her contacts with the home and the associates of the child.

Of the total number of cases studied, 41.67 per cent were satisfactorily adjusted; 18.75 per cent were partially adjusted; 27.08 per cent evidenced some improvement and their studies were continued; and 12.5 per cent evidenced no improvement at all. More than 55 per cent of the cases studied came from either very large families in poor circumstances or from broken homes.

It was found that 70.83 per cent of the cases studied were assigned to the counselor because of the relationship existing between the pupil's intelligence quotient and scholastic achievement. This indicates the possibility of discovering a definite means of locating many of those pupils of whom case studies should be made. The comparatively small percentage of pupils who are assigned to the counselor because of a social maladjustment usually identify themselves by their behavior and mannerisms around the school building and on the playground.

It was also found that 85.42 per cent of the cases studied were boys, which indicates that if the school is not large enough to justify a counselor for boys and another for the

girls, particular care should be taken to choose one counselor who is especially interested in boys and their problems.

Since our schools do have these cases of maladjustment, it is imperative that administrators realize their presence and accept the responsibility of making whatever adjustment is possible.

THE EFFECT OF VARIOUS SUBSTANCES ON THE PARTICLE SIZE OF POTASSIUM BROMIDE CRYSTALS

Richard Karl Oswald, A.B.,
Findlay College, 1927

Department of Chemistry

It has been found that the size of crystals is greatly affected by the presence of a small amount of foreign material in the mother liquor from which the crystals are formed. In certain industries it is important to control this particle size.

Some investigators have determined these effects on individual crystals grown separately, others on crystals grown en masse in a crystallizing dish. The present work is concerned with the latter situation.

Potassium bromide was crystallized from a saturated solution of the salt. Five cubic centimeters of a molar solution of each of the following substances was added to separate dishes of the saturated solution of potassium bromide: potassium sulfide, sodium sulfide, methyl alcohol, propyl alcohol, and sulfanilic acid. To another dish enough gelatin was added to make a 0.1 per cent solution. Each of the solutions was allowed to crystallize at constant temperature. The individual crystals were then measured and photographs taken of each of the several groups of crystals for a permanent record.

The crystals were measured by means of a microscope

with a scale in the eyepiece, which was later calibrated in millimeters. The following average sizes for potassium bromide crystals grown with each of the foreign substances were obtained:

Substance	Average Dimensions of Top Face	
	Length (mm.)	Width (mm.)
Pure potassium bromide (KBr)	4	4
Potassium sulfide (K_2S)	8.1	8
Sodium sulfide (Na_2S)	7	6
Methyl alcohol (CH_3OH)	4.2	4
Sulfanilic acid ($NH_2C_6H_4SO_3H$)	4	3.5
Propyl alcohol (C_3H_7OH)	3	2.8
Gelatin	1.5	1

Pure potassium bromide crystallizes in perfect cubes. In the presence of some of the added materials, unusual shapes were noted. Methyl alcohol caused elongated prisms to form, sulfanilic acid caused flattened flaky crystals, and sodium sulfide caused some crystals to be longer than their width. The most common shape was a flattened cube with the top face square. The presence of crystals whose faces had one dimension larger than the other accounts for the difference in length and width averages in the above table; a greater difference indicates a greater deviation from the square upper face which is normal for potassium bromide.

The results indicate that a definite effect is produced by the addition of each of the various foreign substances, so that, within limits, any desired size of particle may be obtained by adding the appropriate material to the saturated solution. This difference in size produced by the various materials is probably due to varying degrees of adsorption of the foreign material on the surface of the potassium bromide crystal as it grows.

A STUDY OF THE FUNCTIONING OF THE BING LAW IN THE COUNTY SCHOOL SYSTEM OF FRANKLIN COUNTY, OHIO

Ward Herald Overholt, B.S. in Edu.,
Kent State Normal College, 1924

Department of School Administration

In this study the attendance or non-attendance at school of boys and girls who lived in the county districts and who were 14, 15, 16, and 17 years of age on September 1, was investigated.

The enumeration of May, 1929, was taken as a working basis. By inquiry in each district, this was brought down to date as of September 1, 1929. This corrected census was checked against school enrollment in each district and a visit made to the home of each person of one of these age groups who was not in school. At this visit information was secured as to size of family, reason for leaving school, employment of members of the family, attitude toward school, and certification.

Findings:

The corrected net census contained names of 3257 boys and girls; of that number 2892 were found to be in school. One person in ten in these age groups is not in school, or, in other words, one person in each thirty persons of school age is not in school. This ratio includes those exempted on working certificates and also high-school graduates, which two groups together constitute 77 per cent of those not in school. One person of each ten not in school is married.

Of the boys and girls who are working, 82 per cent come from homes where both parents are living and living together. Employed 16-year-olds come from slightly larger families than do 17-year-olds, the difference being in the number of younger children. The average number of children per family in families of employed boys and girls was 5.1.

Two-thirds of those employed had an eighth-grade educa-

tion or less. In the majority of cases, the parents of employed children wanted them to leave school. The reason given most frequently for leaving school was, "dislike for school"; then followed, "to help at home" and "to earn spending money."

Only one-sixth of those who are working are in jobs where there is a chance for advancement.

Of those employed, 104 held certificates, while 44 did not, but 43 of these are eligible—the violation being a technical one.

The Bing Law is functioning well in Franklin County schools. There seems to be a large measure of voluntary compliance since the obstinate cases are few enough to be handled by a part-time officer.

The World: A CRITICAL AND DETAILED STUDY OF The World
A PERIODICAL PUBLISHED 1753-1756

Maude Belle Owings, A.B.,
Otterbein College, 1914

Department of English

This study has for its motive a detailed consideration of the periodical the *World*, together with its editors and their respective contributions.

The five divisions are: (1) the introduction or the history of the *World*; (2) the editor and founder, Edward Moore; (3) the major contributors among whom are Chesterfield, Cambridge, and Walpole; (4) the minor contributors; and (5) a bibliography that includes a list of the 209 papers arranged alphabetically according to respective authorship and numerically according to serial publication.

Of first consideration is it that the *World* edited by Men of Fashion for Men of Fashion and particularly for the so-called *beau monde* differed from contemporary publications

in that it reflected the current observations of a whole staff or corps of able editors in contrast to a single editor, or at most a collaboration of two or three.

Just as important is the eccentric objective of this staff to introduce the novelty of writing a paper from a good-humored point of view, that is, reprehending the fashionable follies and foibles of the day with a view toward change and betterment. Satire and reform were devices to be relegated to the background, yet the reader can't help noting their pervading influences. As such, however, the periodical ranked with the best of its day even equaling the circulation of the famous *Spectator*.

The subject matter is considered in that every subject has been treated from "patches" to war measures. For the most part the intimate study of these articles reveals universality of subject matter, diversity of literary ability, including a subtle humor and a sincerity of human benevolence—in other words, the same characteristics that any similar social organ would exhibit.

Edward Moore was the founder and proprietor of the *World* as well as its most literary contributor. He was distinguished by noble patronage and was able therefore to manage efficiently his coterie of famous and influential assistants. Chesterfield, the great English letter writer and polite diplomat excelled in irony; Cambridge was entitled to the credit of possessing the highest taste, wit, and moral tendency; Walpole was the poet, politician, and historian; Dodsley, the renowned financier of Johnson's *Dictionary*, was a minor contributor; the Earl of Bath, Pulteney, was a figure who was known mostly for his celebrated name, and thus we could go on through the list of thirty-two outstanding English figures. These facts in themselves make for an interesting publication.

But more outstanding and more important, this intimate and detailed study further presents the definite gleanings and comparisons from the letters themselves all of which are readable, alert, and if not important from a literary point of view, very important from a historical point of view.

THE HERO OF THE EIGHTEENTH CENTURY: LOGICAL
DEVELOPMENT TRACED THROUGH THE WORKS OF
THE IMPORTANT AUTHORS OF THIS
CENTURY

Mildred Owings, A.B.,
Defiance College, 1920

Department of English

It has been the purpose of this study to trace the type of hero with its accompanying variations throughout the century. The work is divided into four parts, the first of which is a study of the social and historical background of the century in which the hero is to live, rise, and wane, only to be reconstructed in the succeeding period.

In the second part, the hero is traced through the writings of Congreve, Farquhar, Addison, Steele, DeFoe, Swift and Pope. During this period the hero as a witty man of fashion left from the Restoration drama has been remodeled with Steele's sentimentalism, Addison's moral reform, DeFoe's search for adventure and zeal to preach to humanity at large, to be later touched by the biting satire of Swift. Pope was not a critic of heroes but was rather the critic and lawgiver for the school of the eighteenth century.

The third part continues to trace through the works of Richardson, Fielding, and Rousseau the hero as he soars to great heights away from the hands of the Classicists. Influenced by Puritan sentimentalism, Richardson created heroes purely sentimental with every essential in their characters that made for idealism, which was the epitome of his ethics. Rousseau, the dictator of the present century in education, felt the influence of Richardson and left a model trained to live with nature, away from the fraud of society in the simplest manner possible with deep feeling for things of the spirit and a passion for justice. By the side of the hero of sentiment the realistic hero of Fielding takes its place, more human and genuine in feeling with a vigor that lives.

The fourth part concludes the study with the works of Goldsmith, Smollett, Sterne, Walpole, Chesterfield, Sheridan, and Scott. Opposing sentiment is still at work in the heroes of Goldsmith, Smollett, and Sterne, later touched off by the historians Walpole and Chesterfield. All of these foreshadow the revival of the comedy under Sheridan's direction which suggests a morality and an optimistic confidence in the goodness of man's heart, yet a comedy not free from the diffuse sentimentalism of the period. During the last thirty years the influence of this diffuse sentimentalism was beginning to color and penetrate the doctrines of the rationalists, and the century closes with the work of Sir Walter Scott, a semi-Classicist. Consequently his characters and heroes are men brought to life again with a stamp of romance and chivalry that makes them particularly Scott's ideals.

In conclusion, the hero who has undergone the growth and development of the past century is now characterized by his honor, pride, valor, and virtue, the fundamental traits of the Romantic hero.

SOME MILK MARKETING PROBLEMS IN OHIO

Aaron J. Pancake, B.Sc. in Agr.,
The Ohio State University, 1925

Department of Rural Economics

Dairymen in Ohio have for the past fifty or sixty years found it increasingly necessary for them to coöperate in the selling of their products. The great increase in the concentration of the milk distribution and manufacturing business has been chiefly responsible for this situation.

The plans of selling under which they were organized have changed from time to time, each change being from a relatively simple to a more complex form of organization.

Straight pool plans were followed by classification price plans. These in turn are rapidly giving way to the present basic surplus plans.

The general form which the present plans are taking is based primarily on the fact that the value of milk sold varies with the use to which it is put. Fluid milk sells for a much higher retail price than does milk for manufactured products. Therefore, the present plans call for two prices: (1) one agreed upon between the association and the distributor, which is based on the retail price in the given market, allowance being made for a reasonable dealer's spread; (2) a manufactured milk price based upon the world price for butter. Each shipper is given, by various methods, a certain set quantity of milk for which he can receive the higher, or fluid milk price. For the remainder of his production he must accept the lower of the two prices. Penalties for deviating either up or down from this base amount are provided. Many difficulties appear as the plans continue in use, and new efforts to surmount them are constantly being made.

The Stark County Milk Producers Association is attempting to set up a marketing plan which will help them to overcome the high surplus summer production and the danger of a winter shortage. It is the specific purpose of this thesis to analyze their market and set up a form suggesting a plan of selling which will be workable and will accomplish the desired result.

The present plan is to allow each individual to sell during the summer at the fluid milk price an amount three times that of his average for the previous fall. A trial of the plan has proven this to be inadequate. A revised plan which allows only twice the previous fall average also proved upon trial to be unsatisfactory.

The final plan as suggested in the thesis is to allow each producer as the amount for which he can receive the higher price, a certain per cent of his previous year's daily average. This per cent will change from month to month, and in such a way as to make the total amount of milk for which the dis-

tributor pays the higher price correlate as closely as possible with the demand for fluid milk in the Canton Market.

EXPERIMENTAL DETERMINATION OF THE CHARACTERISTICS
OF CENTRIFUGAL PUMPS AND THE INFLUENCE OF TEM-
PERATURE, VISCOSITY, AND OTHER CHARACTER-
ISTICS OF LIQUIDS OR SOLUTIONS THEREON

L. A. Parker, B.S. in Engr. Chem.,
Georgia School of Technology, 1926

Department of Chemical Engineering

In this investigation an attempt was made to find out just what is the effect of physical properties of liquids or solutions on the characteristics of a single-stage, single-suction, closed impeller, volute type centrifugal pump at approximately its rated speed of 1800 revolutions per minute.

Specifications given in the 1923 A.S.M.E. test code for centrifugal pumps were used as a guide in carrying out tests for pump characteristics. Determination of the characteristics of the pump were made by pumping: first, water at approximately 10°C., 40°C., and 80°C. successively; second, a commercial salt brine solution, of approximately 24 per cent salt concentration, at the same temperatures.

Runs were made at each temperature varying the pump discharge from 0 to full discharge by opening and closing a gate valve in the discharge line. Physical properties of water and brine were determined at each temperature and pump characteristics were correlated according to these properties.

Efficiency and total developed head increased very markedly with increase of specific viscosity, within the range of 0.82 to 1.205; and specific gravity, within the range of 0.982 to 1.181. Temperature, within the range of 10°C. to 80°C., gave only a slightly better efficiency for the lower temperature.

At the lower temperature (10°C.) the curves for shaft horsepower of brine and water intersected at approximately 5 gallons per minute capacity and, as the capacity increased, shaft horsepower for pumping brine increased faster than that for water. As the temperature was increased to 80°C. the brine curve began to approach that of the water as a limit. At the same time the intersection of the two curves moved from the 5 gallon per minute capacity to approximately 45 gallons per minute.

Just what physical properties of a liquid or solution would give maximum efficiency at a specified temperature is still in progress of investigation.

A SURVEY TO DETERMINE THE ADVISABILITY OF A REORGANIZATION OF THE SCHOOL DISTRICTS OF GENEVA TOWNSHIP, ASHTABULA COUNTY, OHIO

Harry Elmer Peck, A.B.,
Hiram College, 1922

Department of School Administration

There are, in the year 1930, three school districts in Geneva Township, Ashtabula County, Ohio: Geneva Exempted Village, Geneva Rural, and Geneva-on-the-Lake Village. The district of Geneva-on-the-Lake came into existence when this area became a village in 1927. The withdrawal of this village from the Geneva Rural School District reduced the latter's enrollment less than 4 per cent but reduced the valuation of the district more than one-third. This occurred two years after the district had bonded itself for \$85,000 to erect a new building. The attorney-general ruled that the village of Geneva-on-the-Lake could pay no part of the debt of the district of which it had been a part. This ruling and its effect upon the finances of the Rural School District were the immediate cause of conducting this survey.

The survey was carried on to determine if a consolidation of the three districts of the township would secure the following results: a reduction in the amount of money spent for the transportation of pupils in the township; provisions for equal educational opportunities for all of the children in the township without materially increasing school costs; and the elimination of dangerous railroad crossings through a different assignment of pupils to the schools of the enlarged district. It was found that all of these things could be accomplished through consolidation of the three districts.

A study was made of the physical and economic conditions of the township. The fact that Geneva Village is the center of community interests for the township was developed. The present school buildings were scored and recommendations were made for their improvement. The relative educational advantages of the school systems of the township were compared by means of index numbers. Property valuations, bonded debts, and tax rates were studied as to trend and were compared with the same items in other districts. The legal procedure required to bring about the consolidation of the three districts was described.

The recommendation of the survey was that the three districts should unite as the Geneva Exempted Village School District as a move towards economy and efficiency in administration of the schools and as a method of securing equality of educational opportunity among the children of the township.

ORGANIC CONSTITUENTS OF OHIO COALS

John Clarence Pew, B.Ch.E.,
The Ohio State University, 1925

Department of Chemical Engineering

The aim of this thesis was to add to the present knowledge of the organic constitution of coal. The method of

investigation chosen was that of resolution of coal by means of solvents. Powdered samples of an Ohio coal from the Pittsburgh No. 8 seam were subjected to the action of various solvents in Soxhlet extractors, in air, and in an atmosphere of carbon dioxide.

Pyridine and phenol were first used as solvents, their action having been much investigated and frequently described in the literature. These dissolved 30 to 40 per cent of the coal. A number of other solvents not described in the literature were also used. Among these latter, showing a distinct solvent action were furfural, benzaldehyde and mesityl oxide. The difficulty with many of the solvents tried was to separate completely the solvent from extracts and residues after extraction was complete. This suggests that the extraction medium acted as more than a simple solvent. It was also found advisable during the course of this work to conduct extractions and other operations in an atmosphere of inert gas to obviate errors due to oxidation.

The solvent action for coal of various glycol ethers was investigated. The mono alkyl ethers of the glycols used dissolved 10 to 12 per cent of the coal, and it is thought that their action is one of simple solution since these solvents are not very reactive chemically. It was found that solutions of caustic alkalies in mono ethyl ether of ethylene glycol will dissolve up to 30 per cent of this coal and that the dissolved portion may be recovered by acidification of the extract.

Glycol ethers alone and in conjunction with alkalies appear to be promising materials for further coal research.

MARKETING EAST TEXAS TOMATOES

Henry H. Pfarr, B.S.,
Stephen F. Austin College, 1929

Department of Business Organization

The tomato industry of East Texas was started for commercial purposes in 1897, when there were six cars shipped.

It has had a steady growth since that time, until in 1930 about twenty thousand acres were planted and over 4400 cars were shipped.

When the industry was first started all tomatoes were shipped in four-basket crates and in the pink stage, but at the present time they are shipped in the Mexican lug and in the green stage. The market reaches from the Rocky Mountains to the Atlantic Ocean and extends into Canada. The territory growing these tomatoes comprises but a few counties centering around Jacksonville, Texas, which is headquarters for both buyers and shippers.

The grower gathers his tomatoes and brings them to the packing shed where they are weighed and graded. As soon as this is finished he is given a receipt which he takes to the office of the buyer and there receives his check for the full amount.

The most important methods used by shippers in selling these tomatoes are as follows: "cash on track," which means that the shipper passes title and receives cash as soon as he delivers the "bill of lading" to the buyer or his representative; "selling in transit," which is selling them while they are on their way to the market; "consignment," which means sale through a representative in the terminal market who sells for an agreed percentage of the receipts; and "joint account," which means that a representative on the terminal market sells the car for the best possible price and divides profit and loss equally.

The East Texas tomatoes are shipped in trainloads which are called "Fruit Specials." They run on schedule time. Should they arrive late enough to interfere with placing the fruit on the market at the proper time, the railroad is held responsible for any decline in price or quality resulting from the delay. The loading and bracing of these cars is supervised by a representative of the Western Weighing and Inspection Bureau.

Market information is secured by the shipper in three ways: (1) through Government reports published daily during the season at Jacksonville, Texas; (2) by wires and

telephone calls; and (3) through personal representation in northern markets.

AN INTERNAL ACCOUNTING SYSTEM FOR SCHOOLS OF COUNTY SCHOOL SYSTEMS

Conwell James Poling, A.B.,
Ohio Northern University, 1924

Department of School Administration

An attempt has been made to find the problem of the small county school in the handling of the finances of extra-curricular activities, to set up criteria by which a workable system would be judged, and to devise a system for operation. No attempt has been made to determine the administrative procedure to be followed when a matter of administrative choice is at hand. The work has attempted only to set forth the principles, to suggest forms for use, and to point out some problems of administration that will have to be faced and to show some possible solutions to them.

The first step taken in the work was the survey of a selected group of twenty-nine schools, made for the purpose of determining the need for better accounting systems, discovering any peculiar conditions affecting the criteria of a system that would be workable in any such schools, and to find any practices that could be used in the set-up of the system.

The literature of the field of internal accounting was searched for data, and finally a set of thirteen criteria established.

From the criteria set up and the forms discovered in the literature, taken from systems examined, and some built to answer the criteria, a system was set up which, in the opinion of the author, will work in any county school, with

adaptation in administrative procedure, no matter what the volume of activity funds handled or how limited the facilities for operating a system.

The system calls for the use of a general treasurer's receipt, a disbursement permit, a record sheet for the general treasurer's general account, one for the general treasurer's activity accounts, a voucher check, a suggested book form for the treasurer of each activity, a form for the submitting of activity budgets, and a form for the submitting of regular financial reports to the activity heads and to the head of the school.

AN ATTEMPT TO TEACH APPRECIATION FOR PERIOD STYLES IN FURNITURE THROUGH A STUDY OF CHAIRS

Earl Clair Powell, B.Sc. in Edu.,
The Ohio State University, 1923

Department of Practical Arts and Vocational Education

Appreciation is defined in this study as "a just and sympathetic estimate, based upon accepted principles of design, construction, materials, and finish." Extracts have been included from writers of past periods dealing with interesting phases which seem to be related to this study. The subject matter of this thesis may be used as a guide to the teacher in directing his pupils toward a better understanding of, and consequently toward a fuller appreciation for, period styles. The thesis is divided into two parts.

Part I is almost purely a study in *Method*. It has been checked by classroom use and found valuable in attempting to teach appreciation for available pieces under discussion.

Part II is devoted to *Illustrative Materials*, with illustrations of pieces selected from the Metropolitan Museum of Art in New York City. To this has been added a bibliography of selected books on furniture which are deemed suitable for the average school library. A more extended list

is recommended if funds are available. The single-line *Glossary* enables the reader to single out specific features and describe and evaluate modern productions in terms of similar criteria. This study assumes that many of these features will remain unnoticed if attention is not directed specifically to them, and also that students really see what they are taught to analyze.

The historical aspect of this study shows, among other things, that many modern pieces have been copied extensively from past periods, extending as far back as fifty centuries; that the first chairs were throne chairs, made for the monarch who gave his name to that particular period style; that the artist and artisan who actually created the new period styles were unrecognized until the time of Chippendale; that springs were introduced with extensive upholstering about the time of the French Revolution; that chairs were made for men, and that the comfort of women was not considered to any great extent until the Queen Anne period; that America was particularly fortunate in having many of the Old World creations combined in its Colonial period; and that America may be credited with having originated the rocking chair. Finally, the evidence indicates that none of the creations of the past have been copyrighted; therefore every manufacturer may select liberally from the past, and present-day furniture may be made up of the accumulation of good features from the past five thousand years.

A DESCRIPTIVE STATEMENT OF BOYS' WORK AMONG THE SOCIAL AGENCIES IN COLUMBUS FOR 1929

Don Davenport Prosser, Ph.B.,
The University of Chicago, 1927

Department of Sociology

The social agencies studied were the boy scouts, Y.M.C.A. City Recreation Department, Knights of Columbus, Settle-

ments, De Molay, and in a more brief way, schools and churches.

The unattractiveness and inadequacy of the equipment of the agencies indicated that in this respect they were laboring under a decided handicap. This is especially noticeable when the equipment of the majority of the agencies is compared with that of some of the competing commercialized interests. A few of these agencies have rather attractive equipment, but in none of them is there room for conducting the program that is attempted.

The restricted financial income explains much of the meagerness of the boys' work. A policy of saving and economy hampers the work. No doubt more money would be expended if it were available, but the income for the work of these social agencies is far from adequate if they are really to function vitally in the community.

The personnel is enthusiastic and ambitious. There are very few that have not at least attended college. It is possible that their training is not so much in the social sciences as it might be. The paid members of the staff are so overcrowded with activities that adequate preparation for the guidance of groups is seldom found. The financial returns are seldom adequate considering the ability required to conduct a useful program.

The program is not sufficient to fill many hours of the leisure time of the boy. Then there is the tendency for the program to be centered about a few boys. The number of different boys touched more than once a month is very small when compared with the possibilities in that regard or what might be the normal expectancy. Aside from the settlements much of the work of the agencies is with the middle class of boys.

The place and value of records were seldom appreciated. Even a general description could not be made from the records. Thus, a brief, inadequate description was all that was available. The Y.M.C.A. was a notable exception.

The conception of boys' work as an educational program was hardly known—certainly not thoroughly conceived as a

consistent philosophy or objective that might aid in the selection and choice of activities. The focus of attention seemed to be upon activities as such. The ease of promotion and the numbers that might participate seemed to be greater factors than the educational and re-creating values that might be found. The basic conception seemed to be that all activities have value, and as long as the boy was entertained or kept busy the work was successful. The educational basis of selecting one activity as competitive with another was not found in the conversation of the boys' directors with the interviewer. The plans of the boards of directors and boys' committees were not carefully thought out or promoted.

The findings of this study indicate:

1. The need for a more thoroughly conceived educational objective.
2. The need for more adequate equipment.
3. The need for a better publicity and educational program for adults who are or might be deeply interested in the work of the agency, and for the general public.
4. The need for better and more extensive coöperation and mutual understanding among the workers with boys.

THE THOUGHT IN POEMS ON DEATH

Paul Rees Rainey, B.A.,
The Ohio State University, 1923

Department of English

This is an attempt to discover the poets' views on the nature of death and immortality and the basis for their beliefs.

The poems considered are: *In Memoriam*, *Adonais*, *Lycidas*, *Elegy Written in a Country Churchyard*, and some twentieth-century lyrics.

In *In Memoriam* Tennyson's faith in individual immor-

tality is based on two major considerations—the unreasonableness of any other belief, and immediate intuition.

Shelley's conception of God in *Adonais* is much the same as Plato's. It is a conception of a supreme Spirit, a universal Perfection, a pervading principle of Beauty. Death is a medium through which man is reunited to this universal Spirit.

Lycidas reveals Milton's faith in an all-wise and just God, in a glorious immortality, and in the value of high and worthy endeavor in this life.

The argument of the *Elegy Written in a Country Churchyard* is concerned with a defense for the type of simple, obscure life led by the "rude forefathers of the hamlet." In its general bearing the poem avoids scepticism and preserves the flavor of a religious confidence in God.

Most of our modern poets do not seem to reveal a religious belief in immortality. When they do manifest any faith, it is of the so-called pantheistic kind—the identification of the dead with Nature. A good many consider death as a mystery and with the characteristic modern spirit of inquiry they beat against the veil trying to get a clue. Failing to find anything tangible, they consider death as the end. They face this end bravely enough, some grimly, some even exultantly. For most of them the sudden, sacrificial manner of dying has the greatest appeal. In the modern elegiac lyrics there is usually no looking forward to meeting beyond the grave. The dead are looked upon as dead, and the poet turns his attention to the tokens of dear remembered days forever gone by.

SOCIAL CUSTOMS OF THE PENNSYLVANIA GERMANS

Mildred Robinson, B.S.,

George Peabody College for Teachers, 1926

Department of History

The German immigrations to the United States and particularly to Pennsylvania began in the seventeenth and con-

tinued increasingly during the eighteenth century. Persecuted for their religious beliefs, heavily taxed by the luxury-loving rulers of the many petty states and principalities of Germany, and disheartened by the devastating results of the Thirty Years' War, the Germans were eager to come to the haven which the colony of William Penn offered to them.

The principal activities of most of the earlier German immigrants centered in the numerous religious sects found in Pennsylvania, many of which they organized before coming to America, while others were formed by disgruntled members who could not agree in all details with others of their group. The Mennonites, Dunkers, and Moravians were the most prominent sects which offered a means of expression for the deep religious fervor of the German element. Somewhat less prominent were the Schwenkfelders, the Woman of the Wilderness, and the more communistic group, The Harmony Society. The religious principles of the majority of these societies resembled closely the doctrine of the Quakers in that they refused to take oaths, bear arms, and baptized only on profession of faith. The celebration of religious holidays was an important aspect of the life of Pennsylvania German communities.

Besides religious holidays, which were usually celebrated in the home as well as in the church, there were a number of other occasions which provided opportunities for social intercourse. Agricultural fairs, held each year, brought old and young together to view the results of the year's work on the farm and to participate in the amusements and diversions commonly found at such places. "Quiltings," "raisings," and "snitzen" parties afforded other opportunities for neighborhood gatherings. Wedding parties, when permitted by religious authorities, were attended by the whole neighborhood. Strange as it may seem, funerals were also more or less social functions, not the least of the day's ceremonies being the bounteous meal served to all who participated. Thus a number of social occasions provided a means of self-expression which was entirely lacking in the more hampered home life of these people.

The Pennsylvania Germans were direct heirs of many strange practices and beliefs. Among these common beliefs were superstitions and beliefs in ghosts; lucky and unlucky days; the influence of certain planets on the elements, upon which subject they have a vast amount of weather lore; belief in curative power of magic, "pow-wow," and the like.

The thesis, in addition, discusses the home life, food, housing conditions, customs, and so forth, of the Pennsylvania German element.

THE EFFECT OF CELLULOSE ON THE DIGESTION AND UTILIZATION OF PROTEIN BY THE WHITE RAT

Ralph George Rohner, B.A.,
The Ohio State University, 1929

Department of Agricultural Chemistry

Among the various methods for determining food values, that of digestibility coefficients is commonly used. The effect of cellulose or crude fiber when present to a considerable extent in the rations of farm animals has been shown by Armsby and by Evvard to be inhibiting on the digestive process. The effects of smaller amounts have not been studied carefully, and it is conceivable that a definite optimum for fiber in the ration exists. Such an optimal value would be that amount which insures a movement of the intestinal contents along the alimentary tract at such a rate that excessive stagnation and bacterial decomposition of the intestinal contents cannot occur, sufficient time being allowed for digestion and absorption.

In an attempt to get closer to an answer to this question, four diets, varying in cellulose and vitamin B content, were fed to adult male white rats and the digestibility of the protein of the several rations determined. Diet I consisted of white flour, dried potatoes, dried lean meat, butter, lard, mixed mineral salts, sugar, and milk powder. The propor-

tions were about the same as those occurring in the average diet used in the northern part of the United States. This diet contained about 0.8 per cent crude fiber, which is about a third to a tenth as much as is found in such natural products as wheat, corn, beans, and fruits or vegetables when the comparison is made on the same moisture basis. Diet I is probably too low in vitamin B for the best nutritive results, and without the salt addition it is too low in certain of the inorganic elements. Diet II was the same as diet I except that enough finely ground Swedish filter paper was added to bring the crude fiber content to about 3.4 per cent. Diet III was made by adding 3 grams of dried brewer's yeast to 97 grams of diet I. Diet IV contained both ground paper and yeast in the same quantities as present in diets II and III respectively. The crude content of diet III was about 1.5 per cent and that of diet IV about 4.1 per cent. The food of each rat was limited to 10 grams a day with a feeding period of 12 days. Three animals were used on each ration.

The coefficients of digestibility found were as follows: for the three rats on diet I (low fiber, low vitamin B) 75., 74.1, and 74.1—average 74.4; for the three rats on diet II (paper diet) 72.4, 80.7, and 81.6—average 78.2; for the three rats on diet III (yeast diet) 84.5, 83.2, and 83.2—average 83.8; for the three rats on diet IV (paper and yeast diet) 77.4, 75.1, and 82.7—average 78.4.

The addition of yeast had a decidedly beneficial effect upon digestibility in these experiments. This result might be expected from the known good effects of the water soluble vitamins B and G on appetite and digestion. Whether the slightly higher fiber content of the yeast diet was beneficial or otherwise cannot be decided from this experiment.

Conclusion:

Moderate amounts of crude fiber, about 3.4 per cent, in the diets of white rats lead to better digestion of the protein of the ration than is had with less fiber, 0.8 per cent. Perhaps of greater importance for good protein utilization is an adequate amount of the water soluble vitamin B and G.

A STUDY OF SCHOOLS AND CLASSES UNDER THE CONTROL OF
BOARDS OF EDUCATION WHICH ARE FOR THE EDUCATION
OF BLIND AND PARTIALLY SIGHTED CHILDREN IN
THE UNITED STATES

Charles Chester Romaker, A.B.,
Defiance College, 1921

Department of School Administration

1. After reviewing the available studies and reports on this subject, it was desired to obtain additional information concerning the organization and administration of classes for blind and partially sighted children in the United States.

2. One form of inquiry was sent to the superintendents and another to the principals of the schools in which such classes are maintained.

3. Replies were received from thirty-nine cities and from ninety-five classes in those cities.

4. The thirty-nine cities are in fifteen of the sixteen states in which there are such classes.

5. of the ninety-five classes, eighty are sight saving, five are for the blind, and ten are not designated as either.

6. Fifty-five per cent of the buildings reported were constructed since 1919.

7. Two-thirds of the buildings reported are fireproof. Three-fifths of them rank among the best buildings.

8. The rooms used by sight-saving classes and classes for the blind are of about the same size as ordinary classrooms.

9. All classes reported except four are in elementary-school buildings.

10. Training, experience, and salaries of teachers are very little in excess of the same for teachers of regular classes.

11. All agencies coöperate in the discovery of children for assignment to classes. The age limits for acceptance range from five to twenty-one. Pupils below 70 I. Q. are not admitted.

12. The large majority of the pupils are native born of native-born whites.

13. There are 1005 pupils reported in the 95 classes.

14. The median age of 423 of the children is 10.5 years.

15. The length of school day and year, the rate of advancement, the academic subjects and types of recreation are the same as for normal children. Hours of study and industrial work are necessarily shorter.

16. There are 111 pupils in high schools in 10 cities.

17. Elementary classes have on the average seven kinds of special equipment each.

16. Of the 649 pupils concerning whom this item was reported, 365 are transported.

19. Busses and street cars are the reported means of transportation.

20. Boards of education are generally responsible for transportation and costs thereof.

21. Teachers convey information to the homes concerning care of defective eyes.

22. Individuals follow a wide range of occupations after leaving the classes.

23. The cost of educating visual defectives is nearly 3.5 the cost of educating children in regular classes.

24. Boards of education receive from the state 24 to 88 per cent of the total costs.

A STUDY OF TEMPER AS A SYMPTOM OF MALADJUSTMENT

Florence Deborah Rosencrans, B.E.,
Western Reserve University, 1928

Department of Psychology

This was a twofold problem—a study of the temper situation itself and an effort at remedial work. Temper was defined as the tendency to become angry. After a survey

of the literature of the subject, excerpts were chosen on the following topics:

1. Classifications of temper (or anger) behavior from different viewpoints.

2. The origin of anger, accounting for its existence in mankind.

3. Experiments to find out what takes place within the organism in anger.

4. Adaptations of anger behavior for wholesome living under modern conditions.

Thirty subjects, who showed temper behavior in the home, at school, or at play, were selected. Twenty-eight of these were junior-high-school pupils. Each subject was studied individually according to clinical methods.

The subjects were divided into four types in which (1) maladjustment was slight and a minimum of remedial work brought results; (2) maladjustment was moderate and a remedial plan was followed over a relatively long period of time; (3) maladjustment was serious, and remedial work was difficult but finally effective; and (4) those where the work was incomplete or unsuccessful. The greater number of cases fall into the second group. There were only two in group four.

Looking behind the immediate temper behavior for the cause of the tension itself, brought to light various adjustment difficulties. The physical condition appeared as a factor in many cases. Remedial efforts were applied in an endeavor to remove the difficulty, the attitude toward the difficulty, or both. Written and dated records were kept of remedial work and of behavior, including both adjustment and occurrence of temper. When tension was lessened through more wholesome adjustment, the temper reactions also decreased considerably or disappeared altogether. Accordingly, the anger response came to be regarded as a symptom of the maladjustment.

MAGNETOSTRICTION OSCILLATORS

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Otterbein College, 1929

Department of Physics

A detailed description is given of the construction of a Pierce Magnetostriction Oscillator. In such an oscillator the mechanical vibrations of the magnetostrictive rod interact with an electric circuit in such a way that the electric current in the circuit produces longitudinal vibration in the rod, which in turn reacts on the electric circuit to maintain a constant frequency at the resonance frequency of the rod.

Frequency stabilization at audio frequencies, particularly, is much more readily attained with the magnetostriction oscillator than with a quartz-controlled oscillator. The resonance frequency of the rod depends on the velocity of sound through it, and so the product of the frequency and length of the rod is a constant for a particular composition and diameter. Quartz crystals with periods below 25,000 cycles are difficult to obtain in bars of sufficient length to oscillate at such frequencies. Magnetostriction rods may be cut to any desired lengths.

A series of measurements was made on dynamic magnetostriction. The "motional" impedance of a lead-filled nickel tube supported axially in a long solenoid was measured for different degrees of magnetization of the tube. A constant alternating current with a frequency range in the neighborhood of the resonance period of the tube was used to give the superposed alternating field. The motional resistance plotted against the motional reactance for each frequency gives a circle whose diameter was found to depend on the magnetization of the tube.

It was observed that a thin tube of a magnetostrictive material exhibits motional characteristics very similar to those of a solid magnetostrictive rod. The angle of lag of the flux behind the current is seen to be about 45° as it is in

the case of solid rods. Also a maximum value of the maximum motional impedance is reached, followed by a decrease, as the magnetizing field is increased.

The decrement increased (indicating a decrease in the sharpness of resonance of the system) as the field was increased. Likewise the resonance frequency of the filled tube was observed to increase slightly with increase of polarization.

As the tube has thin walls the resonance period of the filled tube depends almost entirely upon the velocity of sound through the core material. With discs or can attached to the ends of the vibrating rod the unit becomes an excellent source of sound.

THE ORGANIZATION AND DEVELOPMENT OF YOUNG MEN'S FARMING CLUBS IN OHIO

Floyd James Ruble, B.Sc. in Agr.,
The Ohio State University, 1924

Department of Agricultural Education

The purpose of this study is to present in detail the organization and development of the Young Men's Farming Clubs, and to determine their importance and value in their communities. These clubs are social organizations fostered by teachers of vocational agriculture for young men between the ages of sixteen and twenty-five, living on farms and not regularly enrolled in school.

Data have been reported by twenty-six teachers regarding the activities of their respective clubs. The organization and development of a typical club with which the author has been associated for five years was studied. Factors essential to the development of this and similar clubs were analyzed. Letters were written to and interviews were held with leaders in the field of agricultural education concerning similar organizations in other states.

Teachers of vocational agriculture agree that a Young Men's Farming Club is a valuable community asset. They find it an ideal organization through which to offer part-time courses, promote better community practices, and train young men for community leadership. They find that part-time courses are essential to the formation of Young Men's Farming Clubs and that these clubs are valuable in later promoting this kind of work. Project work, an important part of the club program, is conducted by many members. Examples of good project work are given. The organization and development of the Grove City, Ohio, Young Men's Farming Club is given in detail. The farming club movement is limited almost entirely to Ohio as little has been done in other states in developing organizations to hold the part-time group together throughout the year.

THE RELATIVE SIGNIFICANCE OF TIME AS A FACTOR IN INTELLIGENCE TESTS AT THE COLLEGE LEVEL

Anna Lois Saum, B.S. in Edu.,
Ohio University, 1927

Department of Psychology

Subjects for this study consisted of 110 women and 83 men from the General Psychology classes at Ohio University during the academic year 1929-1930. These students upon entering the University in the fall had taken The Ohio State University Psychological Test, Form 14, under the prescribed time-limit conditions. Later in the year Forms 13, 15, and 16 of this same test were administered to the group under work-limit conditions. That is, they were allowed all the time needed to finish the test. Results of these two tests—number of right responses, number of errors, number of omissions, time used on the work-limit test, and point hour ratio were the materials for the study.

A high correlation was obtained between the time-limit and work-limit rights. The work-limit test was found to be a slightly better prediction of scholastic success than the time-limit. Correlations between time and score were so low as to render time insignificant. The correlations for men were consistently low negative; for women, low positive. Correlations between time and scholarship were low positive, indicating some slight relation between grades and persistence or endurance, or other like factors.

The study tends to show the need for further experimental study of the conditions under which intelligence tests are and should be administered. Emotional and personality traits of the subject as well as conditions in the college where the test is being used are fields to be investigated with the purpose of determining optimum time for college level intelligence tests.

THE APPLICATION OF THE PHOTOELECTRIC DENSITOMETER TO THE MEASUREMENT OF RELATIVE INTENSITY OF X-RAY SPECTROGRAMS

John Frederick Schacht, B.S.,
Capital University, 1926

Department of Physics

There is a need for an accurate laboratory method of determining the relative intensities of X-ray spectrograms. Various factors such as the broadness or resolution of lines, stray or fuzzy lines, the overlapping of lines, the extreme blackening of the film near the central or undeviated image, and the general more or less regular blackening on the remainder of the film, make it impossible to adapt to such a film the instruments in common use for density measurement.

How completely these difficulties are overcome by means of the recently constructed photoelectric densitometer was

thoroughly studied from films obtained by the powder method under varying conditions and by different investigators.

That the intensity of lines for X-ray is directly proportional to the density was assumed to be correct. The problem then was merely to measure correctly the relative densities of the lines.

The laws of photographic transmission were applied and a method developed whereby a curve of densities could be obtained directly by merely plotting galvanometer deflections on semi-log paper. Since all the lines considered in the investigation were broad or partially resolved, the area under the curve above the general radiation, rather than the height of the peaks, was used.

In order to measure the area of the peak it is necessary to extrapolate the density curve from one side of the line to the other. This was difficult at times, due to the irregularities mentioned above. It is advisable, therefore, to eliminate as completely as possible those difficulties resulting from improper alignment of the camera or improper development of the film. It is hoped that the spectrograph itself can be refined so as to eliminate extraneous radiation which produces the blackening of the film and the stray lines. If such can be accomplished, the photoelectric densitometer will provide a much quicker and much more accurate measurement than is now possible.

THE IMPLICATIONS OF THE DEMOCRATIC IDEAL IN EDUCATION FOR THE TEACHING OF HIGH-SCHOOL PHYSICS

Allen Joseph Schneider, B.A.,
The College of Wooster, 1918

Department of Principles of Education

In prehistoric times, man, by empirical methods, acquired a knowledge of physical phenomena. The Greeks, especially

Aristotle, attempted to lay the foundations for a science of physics but their methods were *a priori* and deductive. Until the time of Galileo who introduced the method of experimentation and testing, Aristotle, because of his prestige, was servilely followed as the great authority in science. From that time dates the great advance of science which led to the Industrial Revolution. Science teaching was finally introduced into the English academies and when the American academies were established, science was included in the course at once. The same thing was true of the high schools when they were introduced. Known at first as natural philosophy, the course now called "physics" was very successful for a time, although the proponents of the classical education, the formal disciplinarians, were not friendly to it.

But as time went on, quite an elaborate physics course was developed. To remedy the lack of objectivity, laboratory work was introduced. But as many of the elements of human interest were squeezed out of the textbook course, it became more and more technical. The laboratory course, likewise, became formal and stereotyped.

This defeats the democratic ideal of education which demands a meaningful training—an education for the liberation of intelligence, which fits the members of the state for an appreciative partaking of the new advances of civilization and for taking part in the direction of the affairs of the state itself. This requires a developing of the power of the intellect which dares to combat authority, unintelligent custom, and fears and superstitions of all kinds.

The physics course, because of the help it can give in understanding our industrial age with its growing complexity, and because of its suitability as a medium for instilling the spirit of the scientific method, must be humanized and reorganized so that it will again teach the things man needs to know and in a way that the youth of the land will want to study it. That is, we must not allow it to be too technical nor too formal and forbidding in its rigidity and emphasis on things that have interest only for the expert.

One means suggested to effect this humanization is a

consideration of the learning habits of the child, which requires a psychological rather than a logical presentation of subject matter. It is proposed to get away from the extremely quantitative requirements and make the course more descriptive. In the laboratory we would aim to study more working models of devices used in everyday life and give less time to the verification of abstract principles. To aid these aims, excursions and investigations to study the applications of physics at first hand are proposed; and to give an understanding of the genesis of the science of physics and the contributions of the great geniuses that are responsible for its present state, much attention to biographical and historical material bearing on the subject is urged.

THE EMOTIONAL AND INTELLECTUAL VALUES IN THOMAS HARDY'S LYRICS

Matilda Bernice Sergeant, B.A.,
Wellesley College, 1921

Department of English

The purpose of this study is not necessarily to prove that Thomas Hardy is one of England's greatest modern poets, but to point out the emotional and intellectual elements in his lyric poetry and to evaluate these elements according to worthiness of esteem for their own sake.

Of the many lyrics and lyrical poems, only a very few contain an intensity of emotion approaching a degree of ecstasy or powerful feeling sufficient to make them pure lyrics. As a writer of pure lyrics, Hardy is not among our greatest. However, it is because of these few great lyrics that Hardy's rank as a lyric poet will rest secure.

The great majority of Hardy's lyrics were written not for the joy of self-expression but for the need of expressing in condensed emotional form the different aspects of his

mind which, characteristic of his own temperament and of his own time, was frequently at war with his emotions. It is because of this blending of his emotions, at times intense but more often restrained, with the poet's profound and impressive intellect that his poetry stands out as unique in its relation to the other poetry of today.

Hardy's poetry is of value because of its social and geographical interest. He has portrayed the Wessex country and its inhabitants in such a vivid manner that future generations may live again in imaginative experiences the joys of rural and rustic life which, in reality, will soon be a thing of the past.

Hardy's lyrics will live for us as a powerful document of his moral autobiography. Hardy the poet, individualist, and scientific determinist has presented the whole system of his thought in them. We see his metaphysical ideas of a Universe back of which is an indifferent, unconscious "Immanent Will" which may grow conscious in time, but which enslaves man thus making him and his evil doings a subject for pity rather than contempt. He has done as a poet what he could not do as a philosopher; he has made the idea convincing by his emotional statement of it and his emotional revolt against it. Hardy has given us his ideas of mental states as causing distress, his ideas of eugenics, of social institutions and conventions and their effects on the individual—all in the form of lyric poetry. This largeness of vision portrayed by realism of language and details, together with more or less intensity of feeling, has exalted Hardy to an enviable place as a modern poet. Whether we accept his philosophy or not, we agree that he was a profound thinker who applied the principles of modern scientific thought to his lyric poetry independent of and contrary to the principles as set down by the great lyricists of the early nineteenth century. In so doing Hardy verified Wordsworth's own statement: "Every author, so far as he is great and at the same time original, has had the task of creating the taste by which he is to be enjoyed."

THE RELATION OF GENERAL SCIENCE TO A PROGRAM IN EDUCATION

Arthur Benton Shaffer, A.B.,
Wittenberg College, 1925

Department of Principles of Education

The writer shows in this thesis how science, through discovery and invention, has evolved a changing world. He likewise shows that with this change in the material world new responsibilities have emerged for the individual, facing him with the problem of creating new standards of conduct to meet the conditions of the present. This point, as physical change has been recognized, has not always been stressed, and the attempt to follow standards based on the authority of old sanctions which, in the light of science, are no longer justified, has developed home and social problems with which education must deal. These problems promise to retard the progress of our civilization. This is a situation which education needs frankly to recognize. Educational thought during recent years has shifted from emphasis upon subject matter to an emphasis upon method, but supremely important is the fact that provision has not been made for the training of students who may live intelligently in a changing order.

It is shown in this thesis that the world is in need of an educational program which shall use subject matter as material for the evolution of learning outcomes, commonly called facts, laws, or principles, which shall serve as principles of action in sensing and solving new problem situations. It is further shown that such a program will focus upon the emergence of students who realize their responsibilities in dealing with advances in knowledge to promote the continued development of a richer and more significant social order.

The writer presents a curriculum in general science for the seventh, eighth, and ninth years which illuminates the

program set forth. The curriculum is flexible in its application, adaptable in its construction, and provides for the individual approach of students to problematic situations. It allows for divergence to meet individual differences and encourages integration through the relationship of the units of subject matter and through the group discussion of individual research as different problems within each unit are pursued. This group activity is an attempt to foster coöperation among the students. It thus incorporates in the teaching method the recognition of mutual interests and social responsibilities which the educational program on which this approach to general science is based holds to be of paramount importance in the development of the individual.

A CONSOLIDATED SCHOOL PROJECT IN THE CENTRAL PART OF GUERNSEY COUNTY

George William Shegog, B.S. in Edu.,
Ohio University, 1926

Department of School Administration

The object of this study was to make a careful survey of the school conditions in the three townships (Wills, Richland and Center) in Guernsey County, Ohio, and to suggest ways of improving certain educational inequalities.

The first source of data was that of the county school authorities. From them were secured such facts as current expenditure per pupil enrolled, population trends, age-grade progress, and enrollment by grades.

The second source of data was from other county officials, such as auditor and surveyor. Citizens and board members in different districts were interviewed.

The third source of information was through a questionnaire sent to the home through the school. This was made up of items that would usually be accepted as indicating a

community center. Three types of factors were considered: economic, social, and educational.

The first source revealed that in the financial support of education there existed inequality in ability and effort. It also revealed that there was inequality in educational opportunities, due to poorly trained teachers and teacher-turn-over, as well as to poor facilities.

The study revealed that the consolidation of the districts embraced in this study would save annually approximately twenty thousand dollars, and would greatly improve educational service to the children.

The recommendations were briefly as follows:

1. That the six districts be consolidated with community centers at Lore City, Old Washington, and Senecaville.

2. That the pupils of the districts be transported to the above-mentioned centers.

3. That the six districts improve the educational service to the children and at the same time prevent an annual loss of about twenty thousand dollars.

EFFECTS OF TRAINING AND EXPERIENCE ON THE SALARIES OF PUBLIC-SCHOOL ADMINISTRATORS IN OHIO

Omer Earl Sibert, A.B.,
Ashland College, 1922

Department of School Administration

This study was to determine how salaries of public-school administrators in Ohio were related to experience and training. Data were obtained mainly from reports concerning various administrators, on file in the office of the State Department of Education. Calculations were made for additional experience of county superintendents since the "Certificates of Qualifications" had been filed. Data regarding thirty-six city superintendents were secured from questionnaires.

Data included 99 per cent of all county superintendents, 98 per cent of all rural high-school principals who are under local superintendents in county districts, 97 per cent of all local superintendents, 95 per cent of all city superintendents, 75 per cent of all exempted village superintendents and high-school principals and 47 per cent of all city high-school principals.

The relationship between experience and salaries of all administrators in terms of annual salary increments and initial salaries was determined: (1) for the entire group; (2) for all administrators excluding rural principals (non-executive heads); and (3) for each type of administrative position.

In the second place, the relationships between training and salaries of administrators in terms of differences in salaries based on earned collegiate degrees when experience remained constant were determined: (1) for all administrators; (2) for all administrators excluding rural principals (non-executive heads); (3) for different types of administrative positions.

Lastly, combined effects of training and experience on salaries of all administrators were considered according to median salaries, differences in median salaries, and average annual increments. Finally, salaries of women administrators were sketched from the standpoint of effects of training, experience, and type of position held.

The main conclusions were:

Experience appeared to be an important factor in determining salaries of school administrators, although training measured by earned collegiate degrees seemed to exert a much greater influence.

Median salaries showed definite increases for the first fifteen years experience. The next ten years showed a slight increase in median salaries, although the medians fluctuated considerably. Beginning with twenty-five years experience and continuing to twenty-nine years a marked decrease in median salaries occurred. Median salaries for those with thirty to thirty-four years experience showed definite in-

creases for each additional year of experience, while the median salaries for administrators with thirty-five or more years experience indicated marked decreases.

Differences between medians for various years of experience showed an average annual increment of \$47.86 per year for all administrators. When rural principals (non-executive heads) were excluded, this average annual increment was \$56.57.

Annual median salaries indicated that: administrators with bachelors' degrees received \$258.13 more annual salary than those with no degrees; administrators with masters' degrees received \$735.63 more than those with bachelors' and \$983.76 more than those with no degrees; administrators with doctors' degrees received \$1649.28 more than those with masters', \$2384.91 more than those with bachelors' and \$2643.04 more than those with no degrees. Excluding rural principals these differences were slightly greater.

Medians of experience and salaries for women administrators were lower than medians for all administrators. Other salary variations corresponded very closely to those for all administrators.

THE ABSORPTION SPECTRA OF ISOMERIC DIHYDROXY- ANTHRAQUINONES

Howard Perry Simons, B.A.,
The Ohio State University, 1928

Department of Chemistry

The work on the absorption spectra of isomeric dihydroxy-anthraquinones is an extension of the work on absorption spectra in relation to chemical constitution. By means of this paper the field is extended to include the anthraquinone nucleus.

The ten possible isomers of dihydroxy-anthraquinone have been prepared by methods previously described in the litera-

ture, and purified by the usual methods. The physical properties have been found to be in accordance with descriptions previously given.

The absorption spectra of these compounds have been studied by means of a Bausch and Lomb spectrophotometer, consisting of a constant deviation type prism spectrometer and a modified Martens type polarization photometer. The study was made with the compounds in solution in absolute ethyl alcohol, concentrated sulfuric acid, and 0.2 per cent sodium hydroxide. Only the visible region of the spectrum was observed. The results were recorded by means of absorption curves where the extinction coefficient $\left(\log_{10} \frac{I_0}{I}\right)$

as the ordinate was plotted against the wave length in millimicrons as the abscissa. In addition to this, the wave lengths corresponding to the points of maximum absorption were listed separately. Values of concentration of solution and cell depth were chosen so that the values of extinction coefficient would fall within the limits of 0.00 and 2.00.

In all but a few cases the results of these experiments were found to be in disagreement with the results given previously in the literature. This was attributed to the non-conformity of the experimental conditions.

The experiments show that position isomerism in the anthraquinone nucleus has an effect upon the position and character of the absorption bands of the compound studied. The nature and properties of the solvent also have a decided effect upon the absorption bands.

THE TREATMENT OF ANCIENT HISTORY IN FOUR TYPICAL WORLD HISTORY TEXTBOOKS

Carl Lewis Smith, B.Sc. in Bus. Adm.,
The Ohio State University, 1921

Department of Principles of Education

This thesis is a study of the ancient field of four typical world history textbooks from the standpoint of the extent

and types of facts selected and the method used in presenting them to high-school pupils. The textbooks examined are *World Progress*, West; *Modern Times and the Living Past*, Elson; *Epochs of World Progress*, Barnard and Roorbach; *Our World, Today and Yesterday*, Robinson-Smith-Breasted.

The principal tables in the thesis show the space allotments given to (1) ancient history; (2) ancient civilizations of ancient history; (3) major factors of ancient history, *i.e.*, political, military, economics, scientific, and so forth; and (4) the New History.

The discussion of the tables is based upon the major essentials of the New History, that is, the extent to which the writers of these textbooks (1) reconstruct the leading eras of the past in their entirety, (2) give primary concern for explaining present civilization, and (3) recognize the principle of continuity.

The treatment of the facts in these textbooks is viewed from the standpoint of their providing for (1) a "psychological" approach to subject matter with which pupils have little or no knowledge; (2) the enriching and developing of concepts; and (3) supplementary aids and exercises for the further organization and additional enrichment of subject matter.

The results of this thesis show that (1) space allotment to ancient history varies from one-seventh to more than one-third of the space allotted to the entire field of world history; (2) decided emphasis is still given to military history; (3) social and political history are well represented; (4) economic, scientific, and educational history are not well represented; (5) primary concern for interpreting the present has not always been taken into account in reconstructing leading civilizations of the past; (6) continuity has not always been shown adequately; and (7) the textbooks are so written that they require a great deal of teaching skill.

THE HISTORY OF THE UNITED STATES OVERLAND MAIL TO 1869

Charles Leonard Smith, B.A.,
Ohio Wesleyan University, 1923

Department of History

The purpose of this study is to attempt an interpretation of some of the economic and political aspects of the Overland Mail Service in the years 1849 to 1869.

Falling as it did between two highly significant events in our history, namely, the California Gold Rush and the completion of the Pacific Railway, this service came in for a share of the problems and difficulties that attended western development in these years. Thus, it inherited the controversy attendant upon the outcome of the Mexican War. It overlapped the period of the Civil War. It was distinctly identified with the constant and irresistible westward movement of the frontier, the stagecoach providing both mail and passenger facilities for communication between the settled east and the new settlements of the far west.

This work divides itself conveniently into six parts, devoted to the purely historical aspects of the subject, a description of the service and an analysis of some of the political and economic problems created by it. The treatment embraces the following topics: a brief survey of United States postal history to 1850; a description of the leading overland mail routes from the Missouri westward to the Pacific; an account of the peculiar institution known as the Pony Express; a story of rival staging firms on the plains and a portrayal of stagecoach traveling conditions; the Government's Indian problem as it affected the mails; and finally the transition in mail transportation from stagecoach to railway with the completion of the Pacific Railway in 1869.

Some attention is given to the postal deficit during these years, and the determination of the Post Office Department

to administer the mail service to the satisfaction of the far west regardless of a deficit. These efforts mark the connection between the overland mail and western settlement; and together with the unifying effect of the mails during the War of the Rebellion, indicate the value of the overland mail in encouraging and maintaining the growth of our national dominions.

THE MAKING OF A SCOUT; A CRITICAL STUDY OF
"KIT" CARSON'S EARLY CAREER

Della Fern Smith, A.B.,
Defiance College, 1927

Department of History

This study concerns Christopher Carson as a scout in the making. It points out how his preparation and traits of character fitted him for guiding Frémont.

Biographers of Carson have included statements in their accounts which do not agree, which are inaccurate, or which are questionable. In addition to the purpose mentioned, the writer has endeavored to point out a number of such statements in a critical manner.

The study begins with a short introductory sketch of the West, more especially with reference to the buffalo and the beaver, the Indians, the fur-trading companies, the independent trappers, and the explorers who gave the people of the East written accounts of their travels. Then it takes up the story of Carson's early manhood, his trip with a caravan to Santa Fe, and his two periods of unemployment when he starts unwillingly for the States and receives employment each time which takes him back to New Mexico. At last he enters the work of his choice, that of trapper or trader under such men as Ewing Young, Thomas Fitzpatrick, Thomas McCoy, Jim Bridger, Captain Lee, Fontenelle, Thompson and Sinclair. He comes

into contact with men of the Hudson Bay Company under Peter Ogden, with men of the Rocky Mountain Company, and with many other trappers. He meets persons of renown such as Sir William Stuart, Father de Smet, and John Charles Frémont. He also meets men of the unrefined, bragging type. He acquaints himself with the actions and customs of the Apaches, Blackfeet, Sioux, Crows, Cheyennes, Comanches, Navahoes, and Utes as he comes into contact with them. As he travels about the West he gains considerable geographical knowledge. He goes along every important stream of the Rocky Mountains and into California and Mexico. This knowledge and his various experiences in the West make him a fit person to be selected by Frémont to guide him on his three government exploring expeditions in the West.

AMERICAN INVESTMENTS IN THE CARIBBEAN

Gerald Burrell Snedeker, B.A., B.Sc. in Edu.,
The Ohio State University, 1929

Department of History

An investigation has been made in four Caribbean republics of the relation between large investments of American capital and intervention by the United States. They are Cuba, Santo Domingo, Haiti, and Nicaragua.

The Platt Amendment, which gives the United States the right to intervene in Cuba to protect life and property, has served as an excuse for several American interventions. The danger of destruction to American-owned sugar plantations during revolution was the cause of American intervention and occupation in 1906, and the use of United States troops in 1912 and 1917.

The sudden decline in the price of sugar after the World War left the banking facilities of the island in the control of Wall Street and the greater part of its main industry in

American hands. Cuba has nominal political independence, but is economically dependent on the United States.

A dispute of an American corporation with the government of Santo Domingo led to partial customs control in 1904. In 1907 a customs receivership was established by treaty which was to last until a proposed twenty-million-dollar bond issue was redeemed. An alleged violation of this treaty resulted in military occupation by the United States in 1916. All acts of the Occupation had to be ratified and the loans validated before troops were withdrawn in 1924.

The United States established military government in Haiti in 1915, but the State Department had been interfering in Haiti for some time in connection with the Bank of Haiti, partly owned by the National City Bank of New York, and a government-guaranteed railroad, to which the New York bank had lent money. Despite the fact that that railroad had its inception in fraud, the Occupation carried out the contract. Most cordial relations have existed between the State Department and the officials of the National City Bank, which has benefited handsomely from American intervention in Haiti.

The United States has played an active part in Nicaragua since 1909 when a despotic President was deposed in a revolution supported by American interests. An American customs receivership was established in 1911 in connection with a loan by American bankers. The National Bank of Nicaragua and the government-owned railroad have been controlled most of the time by these bankers because they have been pledged as security for loans. Large forces of American marines were landed during the revolutions of 1912 and 1926 after American interests, particularly the bankers, had requested protection.

CONSTITUTIONAL TENDENCIES IN INDIA SINCE 1920

Gertrude Nevison Stanley, B.Sc. in Edu.,
The Ohio State University, 1929

Department of Political Science

For more than one hundred years Great Britain has been faced with the problem of how to organize her relations with India. In recent years the movement for self-government in India began anew, and in 1917 England made a declaration promising to meet Indian demands for autonomy in return for Indian loyalty during the World War. In 1919 an attempt was made to fulfill this promise by the so-called Montagu-Chelmsford Reform Act which established a new constitution for India.

The form of government established for India by the Act of 1919 has never been entirely satisfactory to either India or Great Britain. Consequently, for two years, beginning in January, 1928, the Simon Statutory Commission studied the Indian situation, hoping to make recommendations for the next stage of India's political future which would be satisfactory both to Great Britain and to India. The publication of the Report of the Commission in June, 1930, seems to have left the relations between Great Britain and India essentially the same as they were. In spite of the recommendations for an Indian federation with almost complete provincial autonomy, there has been a noticeable increase in hostility in Indian political leaders. It is designed that these recommendations shall be further discussed at a round-table conference to be held in London beginning October 20, 1930. At this time the political status of India will be decided upon if agreement can be reached by the British Government, the Indian Government, the Indian Nationalists, and the Native States, all of which will be represented at the conference.

If the problem is to be settled this fall, there must be further compromise on both sides. India must be willing to cooperate with Great Britain, and must be open to com-

promise if her ambitions are to be fulfilled to any degree very soon. On the other hand, the British must make further concessions to India in order to restore that country to any semblance of order, contentment, and prosperity.

It is a matter for coöperation on a reasoned-out sound basis. India must conquer her impetuosity and Great Britain must overcome her inclination to move doggedly if an agreement is to be reached this fall. India is not ready for a complete grant of independence. For some time to come she must undoubtedly remain a member of the British Empire, for the sake of preserving her own internal unity and for external defence. But in all matters of detailed administration Great Britain must go further toward granting Indian freedom than she has hitherto gone.

REFLECTIVE THINKING AND ITS EDUCATIONAL BEARING ON THE TEACHING OF HIGH-SCHOOL CHEMISTRY

Harry Omar Stout, B.Sc. in Agr.,
The Ohio State University, 1915

Department of Principles of Education

The phrase "to think," in common parlance, has been so general in its applications that it has covered all forms of mental activity that occur during our conscious moments. In this study, however, it has special reference to that characteristic human activity used in approaching and solving problematic situations. Consequently, this type of thinking involves both the finding and testing of suggested meanings relative to the problem confronting the individual. It is distinguished from other types of thinking by the characteristic which insists upon the testing of the proposed solution. Such thinking is designated "reflection." The experiment reported herein was limited to a consideration of teaching method with reference to the promotion of reflective thinking on the part of the pupils.

During the past thirty years there has been a shift in educational objectives. Schools have been severely criticized for not preparing the individual to meet the requirements of life activities. The learning products of the school failed to transfer and fit in with the needs of life. Society, demanding that the individual assume an attitude and type of behavior that conform to the expectations of the group, forced education to take stock of its ends. The individual is expected not only to solve his own problems satisfactorily but also to contribute intelligently to the solution of problems that are of vital importance to the welfare of his social group. One of the paramount objectives in education has become, therefore, to train the individual in such a manner as to develop the correct habits of critical, logical, and independent thinking. The realization of this aim is of supreme importance if he is to adapt himself to the changing needs of civilization.

What plan should be followed in teaching chemistry if independent thinking becomes the desired end product? The traditional methods of teaching chemistry justified the procedure on the basis of "information gained." Perhaps other methods attain the same end and to the same degree. The experiment herein reported was conducted for the purpose of evaluating the traditional versus the laboratory plan both from the standpoint of information gained and the development of reflective thinking.

Results from this experiment show that the laboratory plan promoted mastery of facts equally as well as did the traditional method. In addition, a checking up revealed that the laboratory plan developed a more critical and problematic approach to new situations which the individual wished to solve than did the traditional type of procedure. These results led the writer to conclude that reflective thinking may be developed on the part of pupils as they pursue their work in chemistry, and this without consequent loss in basic information peculiar to this subject-matter area.

THE CONSTANCY OF A FINGER TETANUS UNDER CERTAIN TYPES OF CORTICAL AND MANUAL ACTIVITY

Esther Margueta Stubbs, B.A.,
The Ohio State University, 1929

Department of Psychology

This thesis is a study of the changes occurring in the constancy of a finger flexion produced by a faradic current from an electrode over the motor point of the muscle of that finger.

The subjects sat in a semi-soundproof room for about fifteen or twenty minutes with the finger flexing once every 1.6 seconds. In one experiment the external conditions were well controlled and kept constant. In the second experiment the subject gripped a dynamometer and held it for ten seconds while the finger was flexing at regular intervals. In the third experiment the subject listened to music part of the time and at other times did some multiplication orally.

The results showed that it is possible to obtain finger flexions which, when the stimulus is kept constant and other conditions well controlled, are surprisingly uniform in extent. There were great individual variations in the extent of the flexion. In the second part of the study it was found that the extent of the flexion lessened during the contraction of a homologous group of muscles. This change did not depend upon the strength of the simultaneous contraction as measured by a dynamometer. The third part of the investigation showed that the extent of the flexions was lessened also during cortical activity, that is, while multiplying numbers or listening to music.

ALLIED OPINION ON AUSTRO-GERMAN UNION

Karl Otto Suessenguth, B.A.,
The Ohio State University, 1925

Department of History

Dynastic interests of the Hohenzollerns and Hapsburgs made the complete unification of the Germanies impossible in the nineteenth century. Bismarck was forced to expel Austria from German affairs, but later an alliance was formed that meant their coöperation in an imperialistic policy that might have culminated in the Pan-German dream of *Mittel Europa*. In defeat they went back to the old idea of the Frankfort Parliament and demanded the union of Germany and Austria, the Anschluss.

Following the Armistice, the German and Austrian constitutions provided for the union. This however was prevented by the French at the Peace Conference since they had no desire to see Germany make up her losses in territory and population by the annexation of Austria.

The new boundaries separated Austria, a banking, commercial and manufacturing center, from her markets, raw materials, foodstuffs, and mineral fuel. Conditions became so bad that the League instituted a plan for rehabilitation embodied in the Geneva Protocols of October 4, 1922. The Financial Committee of the Council reported that Austria must establish an equilibrium in her trade. Austria has attempted this over a period of ten years. By negotiations she has tried to lower the high-tariff barriers with which she is surrounded, with only slight success. Intensive farming has been encouraged with the idea of cutting down that import item. Austria has developed her water power in order to cut down the importation of mineral fuel. In 1929 her exports amounted to 65 per cent of her imports. Annexation to a larger economic unit seems inevitable if Austria is to maintain her present population.

Anschluss however endangers French security. It is not French policy to allow Germany to emerge from the war

stronger in population and with her territorial losses made up in Austria. France has attempted to realize several plans in order to prevent this. The first, that of the proposed Danubian Confederation which would include Austria and thus break up the German bloc, is acceptable to Italy, Austria, and the Little Entente States. Italy has no desire to have a strong government on her northern frontier that might back Jugo-Slavia in a quarrel over Fiume. Czechoslovakia fears that the three million Germans in Bohemia, together with Austria's almost seven million, would give control in such a confederation to the Germans. In addition, a confederation of this nature would inherit trouble with Soviet Russia over Bessarabia, and the Bohemian Germans might be a source of friction with Germany.

Briand's plan of the United States of Europe would improve Austria's economic position but is unacceptable to those states that find the plan further guarantee of the *status quo*.

The system of alliances under French tutelage which at present guarantee the *status quo*, have encouraged those states that wish revision of the treaties to combine themselves in a rival combination. Thus French security, dependent upon the Little Entente and the Polish Alliance, finds itself confronted with the friendship of Italy, Hungary, Austria, Germany, and Bulgaria whose interests look toward revision of the treaties.

Perhaps French security will make Anschluss necessary as a means of withdrawing the German bloc from a potential alliance indirectly aimed at French security.

INFLUENCE OF MOISTURE ON THE OXIDATION OF MILK POWDER AT 85°C.

Chia Yu Sun, B.A.,
University of China, 1929

Department of Agricultural Chemistry

Spontaneous changes in fats and oils constitute rancidity. The term rancidity is used in two different industries to

represent two entirely different changes that take place in fats and oils.

(1) Hydrolytic type of rancidity: There is always an increase in titratable acidity. The presence of any trace of lipase, the fat-splitting enzyme, will hasten to promote this type of rancidity. As a whole this type of reaction is the hydrolysis of glycerides, with the liberation of free fatty acids.

(2) Oxidation type of rancidity: Oxygen is necessary in order to produce the oxidation type of rancidity. Heat, light, and moisture, together with the presence of certain metals which catalyze the reaction, hasten the oxidative process. The oxidation of fats and oils containing unsaturated acids results in the formation of aldehydes, ketones, and acids having a lower molecular weight than the acids which were naturally present.

The term rancidity as employed in the oil and fat industry usually applies to the oxidative process, whereas in the dairy industry it applies to hydrolysis with the corresponding liberation of butyric acid which can be detected by its characteristic odor. As a general rule both oxidation and hydrolysis occur simultaneously, so that probably from the industrial standpoint no sharp line of demarcation can be drawn; although from the chemical standpoint the two mechanisms are sharply differentiated.

Scientists have shown that the oxidative process of fat can be divided into two periods. They are the period of induction and the period of oxygen absorption. Concerning these topics, the peroxide theory and also the hydration and dehydrogenation theory are discussed.

From the experimental results:

(1) Whole milk powder showed the longest induction period toward oxidation at 85°C. when the moisture content was lowest. At zero moisture content the induction period seems to approach infinite time.

(2) Whole milk powder showed the slowest absorption of oxygen, once oxidation had begun, when the moisture content was lowest.

(3) The formation of water from combination of lactose and casein and the formation of acrolein from glycerol in milk powder render a realization of zero moisture content impossible.

(4) Whole milk powder showed a rancid odor after oxidation. At 1.5 per cent to 3 per cent moisture the rancid odor was maximum.

(5) Whole milk powder showed a browning effect during oxidation which was directly proportional to the moisture content in the sample.

From both the laboratory and library work my recommendations regarding the keeping qualities of milk powder are stated as follows:

(1) Humidity Equilibria. Moisture content as low as possible.

(2) Preservation with different gases. Packing in an atmosphere of nitrogen or other inactive gas.

(3) Complete removal of O_2 by vacuum.

(4) Low temperature.

(5) Possible use of anti-oxidants such as glycerol or certain sterols.

HISTOLOGY OF THE INTESTINAL TRACT OF TWO MINNOWS

Notropis atherinoides (Rafinesque) and
Notemigonus chrysoleucas (Mitchill)

Thomas Clogg Surrarrer, B.S.,
Baldwin Wallace College, 1928

Department of Zoölogy and Entomology

It was the purpose of this study to compare both histologically and morphologically the intestines of two minnows, *Notemigonus chrysoleucas* and *Notropis atherinoides*. These two forms were chosen because of the decided difference in the lengths of their alimentary canals.

A careful study was made of the length of the gut in relation to the length of the specimen, and the following constants were determined: for *Notemigonus chrysoleucas* 1.25, and for *Notropis atherinoides* .89.

The morphology and histology of the gut and its appendages were carefully studied in both cases, special attention being given to the coils of the gut, the presence or absence of valves, the entrance of the bile and pancreatic ducts, the nature and position of the pancreatic tissue, and a cellular comparison of the various regions of the gut.

Sections were made through the various regions of the canal as well as through the entire viscera, from which the following conclusions were drawn.

Conclusions:

1. In the study of the two forms no pronounced cellular difference was observed from esophagus to anus, and both forms seem to be very similar histologically.

2. The entrance of the bile duct is well toward the anterior end of the stomach.

3. The processes of digestion are undoubtedly the same throughout the gut.

4. The goblet cells are present in the region of the stomach.

5. The stomach region possesses a thin wall.

6. Both forms are without pyloric valves.

- (a) The above six facts seem to prove rather conclusively the absence of a stomach.

- (b) The rather numerous regular folds throughout the gut of atherinoides prove its large absorbing surface and may account in part for the shortness of the canal.

- (c) Both forms possess a pancreas which is distributed through the mesenteries, and which is neither surrounded nor dispersed in the liver substance.

- (d) Pancreatic ducts enter the common bile duct, and minute ducts seem to enter at irregular intervals along the canal.

A STUDY TO SHOW THE FREQUENCY AND IMPORTANCE OF UNCOMMON WORDS IN A BIOLOGY COURSE

Lloyd Martin Swan, B.S.,
Mt. Union College, 1925

Department of Principles of Education

The problem in this study was to find the uncommon and technical words and the frequency with which each word occurs, and to devise some method of rating these words as to their relative value in a high-school biology course.

The writer found all words that occur in three widely used biology textbooks, and that do not occur in Thorndike's, *The Teacher's Word Book*. A table was prepared which shows the frequency of these words in each textbook. A second list of words was prepared from the first including only words with a frequency of two or more. This second list was submitted to twenty representative biology teachers for evaluation. A credit number showing the relative importance of each word in the opinion of the group of teachers was then figured and Table II prepared.

Among the conclusions reached in the study are the following: (1) that the names of nearly all of the plants or animals listed were checked as essential; (2) that about half of the second list were marked as essential by most of the teachers; (3) that words associated together were usually given the same rating, showing that the teachers were consistent in their checking of the list; (4) that some words used in biology texts are unnecessary and confusing to the students; (5) that the authors of these three textbooks have been careful to use the uncommon words only after the student has become familiar with the meaning of the word.

This study is significant in that it furnishes some objective data which we may use in making out word tests in biology. It gives a measure of the relative importance of uncommon words by carefully selecting the words that the teacher feels are necessary to the course from the stand-

point of the objectives that she has outlined for the year. Other words may be replaced by more easily understood terms or phrases, and others omitted entirely. If the teacher wishes, a table of her own might be compiled from Table I, and then checked against Table II. Where additions or omissions are encountered, if the teacher has valid reasons for them, a more helpful table to her, personally, would result. It might be used in suggesting a better classification of textbook material, by arranging and emphasizing the new words in the divisions of biology to which they belong. This might be of value in making biology a more interesting and more vital subject to the major aims of secondary education.

A STUDY OF THE HOME ROOM ACTIVITIES OF THE SENIOR AND FOUR-YEAR HIGH SCHOOLS OF OHIO

Carl Vernetta Thompson, A.B.,
Ohio University, 1920

Department of School Administration

The purpose of the study was to secure definite knowledge concerning current home room practices in Ohio four-year and senior high schools; to learn the attitude of Ohio school men upon the home room project; and to prepare suggestive outlines of organization and activities for the home room.

The problem was studied under the following headings: (1) Purposes; (2) Organization; (3) Duties of the Home Room Teacher; and (4) Home Room Activities. A questionnaire concerning these topics was mailed to five hundred four-year and senior high schools of Ohio. Only high schools having an enrollment of one hundred or more were included. The questionnaire was returned by 55.2 per cent of the schools and of these 54.2 per cent reported the use of home room activities in their schools.

The purposes of home rooms receiving the highest scores by high-school principals are: (1) to establish a definite place where a student may go for sympathetic advice, necessary information, and the like, 57 per cent; (2) to inculcate the habits, ideals and attitudes of the school, 55 per cent; (3) to check absentees and tardiness, 55 per cent; (4) to facilitate the giving of personal attention to each student, 49 per cent; and (5) to help pupils adjust themselves to new environment, 48 per cent. The per cent above refers to the relation between the number of principals rating the purpose of major importance and the total number of principals rating the purpose.

Forty-four per cent of the home room periods fall at the beginning of the forenoon session of school and 31 per cent at the beginning of the afternoon session, leaving only 25 per cent of the periods placed at other times during the school day.

The median of the number of minutes per week devoted to home room activities for the schools in Group I (Schools with enrollments between 100 and 300) is 125 minutes; for Group II (Schools with enrollments between 301 and 800) 119 minutes; and for Group III (Schools with enrollments of 801 and upward) 78 minutes.

The most common method of grouping pupils for home rooms was according to the class in school to which the pupils belong. This method was used by 80.8 per cent of the schools in Group I, 67.6 per cent of the schools in Group II, and by 38.5 per cent of the schools in Group III. Only 12.3 per cent of the schools divided the pupils according to ability for home room purposes. Boys and girls were segregated in the home rooms of 11.2 per cent of the schools reporting.

The student officers common to the typical home room are: president, vice-president, secretary, treasurer, thrift-officer, and ticket-seller.

The tenure of the home room teacher with the same group of pupils is for the period of one year in 87.9 per cent of the schools in Group I, 79.2 per cent of the schools in Group II, and 37.3 per cent of the schools in Group III. Group III

retains the teacher for three or four years with the same home room pupils in 40.6 per cent of the schools. This is the only group that to any appreciable extent retains the teacher for more than one year with the same pupils.

Parliamentary law is made use of to some extent in 66.6 per cent of the schools in Group I, 67.4 per cent of the schools in Group II, and 79.3 per cent of the schools in Group III.

As was to be expected the curricula of home rooms varied greatly among the different schools. The following activities were common to 50 per cent, or more, of the schools reporting: (1) the recording of absences; (2) the selling of tickets for school functions; (3) the preparing of programs for assembly; (4) the making of programs for promoting school spirit; and (5) the making of programs on manners or conduct.

THE INFLUENCE OF THE LENGTH OF THE INTER-CYCLIC INTERVAL ON PURSUITMETER LEARNING

Maurice Emanuel Troyer, A.B.,
Bluffton College, 1923

Department of Psychology

This thesis is the result of an experiment to determine the effect of different length rest interims on the amount of practice necessary for the acquisition of motor skill.

The Renshaw pursuitmeter was the apparatus used. The problem of operating the pursuitmeter is one of eye-hand coördination. The action is of the serial type, calling for responses which are adapted to motions of the machine that cannot be preconceived. The subject tries to maintain continuous contact between two smooth electrodes. One of the electrodes is propelled by an electric motor, through a system of differential gears, in such a way that it does not

repeat the same motion any time within a cycle. The running time of a cycle is approximately four minutes.

There were forty subjects in the experiment. Each subject had thirty-six cycles of practice. The subjects were divided into five equal groups with rest periods as follows:

Group I. Thirty-six consecutive cycles without rest.

Group II. One minute rest between each of thirty-six cycles.

Group III. Three minutes rest between each of thirty-six cycles.

Group IV. Five minutes rest between each of thirty-six cycles.

Group V. Nine minutes rest between each of thirty-six cycles.

The lost contacts were recorded by a Renshaw polygraph. The protocols were recorded by the experimenter on the polygraph tape opposite the record of lost contacts.

The results may be summarized as follows:

1. Within the limits of the experiment, the longer the rest period the faster the subject learns, or the quicker is the acquisition of motor skill. It must be remembered that the longest rest period in this experiment was nine minutes.

2. The means of each group show that the same degree of efficiency was reached by the end of the thirty-six cycles.

3. Initial performance is not an index of ultimate success. Correlation: $.069 \pm .089$.

4. Scores on The Ohio State University intelligence test correlated $.02 \pm .112$ with initial ability and $.19 \pm .072$ with final ability.

5. In the acquisition of a new skill longer rest periods are most essential during the early stages of practice.

DON SEGUNDO SOMBRA AS A "GAUCHO" NOVEL

Gertrude Margaret Walsh, B.A.,
The Ohio State University, 1906

Department of Spanish

In the national evolution of the Argentine, there appeared a new type known as the "gaucho." The origin of the term gaucho has been a subject of much discussion, and although twenty-six explanations have been offered no definite etymology has as yet been determined.

The gaucho was a social and psychological type, being a new adaptation of the European mind to American life. This new type—and he was to be found in the country, the pampa, rather than in cities—was a "new proof of the mental superiority of the Aryan race."

The gaucho identified himself with the national literature; first, in the popular lyrics, and after 1810, in the popular epic forms of Hidalgo, Ascasubi, and Hernández.

Later gaucho literary developments were the novel and drama, both associated with the name of Eduardo Gutiérrez, whose novels fixed the gaucho type and provided the inspiration for the gaucho drama.

The importance of the gaucho is not only social, but also spiritual, inasmuch as he exerted an influence on all the literary genres of the Argentine.

Gaucho literature is characterized by the desert background and treatment of gaucho life and by the idiom—*lenguaje gauchesco*—peculiar to the type.

In the gaucho novels of Eduardo Gutiérrez—of less importance intrinsically than as an influence in later literary developments—we do not have the characteristic gaucho idiom, although gaucho life is presented in a desert or pampa background.

As an example of a later gaucho literary flowering, *Don Segundo Sombra* (1926), a novel by Ricardo Güiraldes is presented as representative of the best contemporary gaucho

prose. The novel is typically gaucho in its pampa background, treatment of gaucho life, and in the use of the *lenguaje gauchesco*.

Don Segundo Sombra, in its impressionism and in the uniqueness of conception and treatment of the dominating character, *Don Segundo*, also exemplifies the new technical procedure known as modernism.

In conclusion, I feel that to classify *Don Segundo Sombra* as gaucho is not sufficient; but I am at a loss to know just how to distinguish a work of so complex literary manifestations from other gaucho novels of less subtle treatment. In the final analysis, genuine art rises above classification.

FACTORS AFFECTING THE MELTING PROPERTIES OF ICE CREAM

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The University of Illinois, 1928

Department of Dairy Technology

The purpose of this work was to determine some of the factors which cause an objectionable appearance of ice cream as it melts down on a serving dish. It is generally conceded by the industry that an ice cream that melts properly should show a smooth, glossy, creamy consistency. From melting tests which were run on samples of ice cream collected from various manufacturers, it was found that there was much variation in the rate of melting and appearance of the ice cream.

The ice cream which was made for these experiments was kept under the same conditions as it would be in a commercial ice cream plant and confectionery. The ice cream mixes used were all made up to contain 12 per cent fat, 10.5 per cent serum solids, and 15 per cent sugar. The ingredients used were 40 per cent cream, 8 per cent plain condensed

milk, and sucrose. The freezing was done in a 40-quart brine freezer. The mixes were made up in a pasteurizing vat, pasteurized, viscolized, cooled over a surface tubular cooler, and then aged for four hours at 40°F. before freezing. Samples were drawn from the freezer at 90 per cent overrun and hardened for 48 to 72 hours before melting tests were run. In each group of mixes made one control batch of the composition mentioned above was run along with several batches of the variable factor studied.

In making the melting test the sample was measured out with a size 8 ice cream dipper taken level full. The sample was placed on a 16-mesh wire gauze through which the melted material passed into a graduated glass cylinder.

The following factors were studied to see what effect they had on the finished ice cream:

1. The effect of viscolizing temperatures and pressures.
2. The acidity of the mix and the effect of neutralizing the mix to a lower per cent acidity.
3. The use of gelatin in varying amounts.
4. The use of egg yolk powder in varying amounts.
5. The use of improvers and rennet.

From the results obtained in the experiments it was found that:

1. Viscolizing temperatures and pressures affects the rate of melting but does not change the appearance of the ice cream as it melts down.

2. In the ice cream in which the acidity was greater than .35 per cent or a pH of 6.25 the type of melting was objectionable. The casein was precipitated and did not pass through the screen. This left a large amount of curdled material on the screen.

3. Neutralizing the acidity in the mix with $\text{Ca}(\text{OH})_2$ increased the rate of melting of the ice cream. The material left on the screen was a light, foamy material.

4. Gelatin when used in excess due to the colloidal viscosity, gave the ice cream an appearance of not melting. The material left on the screen was a spongy, soggy material. Those samples containing .35 and .45 per cent gelatin gave the best results.

5. The use of egg yolk powder in the mix up to 0.6 per cent did not cause an objectionable type of melting.

6. The improvers used in this experiment caused an objectionable type of melting. The material left on the screen was a spongy, soggy material.

7. The ice cream which contained an active enzyme wheyed off after being exposed to room temperature for thirty minutes.

THE STATUS OF TEACHERS' MEETINGS IN CITY AND EXEMPTED VILLAGE SENIOR AND JUNIOR HIGH SCHOOLS IN OHIO

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Bluffton College, 1925

Department of School Administration

This study is limited to the collection, organization, and summarization of data relative to present practices in teachers' meetings and to the attitudes and preferences of teachers in regard to teachers' meetings in city and exempted village senior and junior high schools in Ohio. The aim is to find out as far as possible to what extent present practices and teachers' preferences are in agreement.

The data relative to present practices in teachers' meetings were gathered during February, 1930, by the use of a questionnaire to principals in 136 first-grade city and 34 exempted village high schools in Ohio. Thus, 170 schools out of the total of 291, or 58.4 per cent, are represented in this study. The principals were requested to give the names of two of the most capable teachers in their system. The number of teachers whose names were submitted was 283. Questionnaires were sent to these teachers to get their criticisms of present practices and suggestions for the improvement of teachers' meetings. The number of teachers who replied is 188, or 66.5 per cent of the total.

The following conclusions are drawn from a study of the data collected from principals and teachers:

1. Many teachers' meetings are not carefully planned.
2. Most teachers prefer that both general and departmental teachers' meetings, be held monthly on either of the first three days of the week and that meetings be not longer than sixty minutes.
3. The general topics for discussion at teachers' meetings which teachers consider of greatest importance are: (a) discussion of educational policy of the school; (b) discussion of possible improvement in classroom teaching; (c) study and discussion of the best educational thought of the day.
4. Fifty-seven per cent of the teachers state that teachers' meetings have been worthwhile.
5. The three reasons for unsuccessful teachers' meetings most frequently mentioned by teachers and the percentage of teachers who mentioned the various reasons are:

(1) Topics are discussed which are not of interest and value to all teachers; 72.3 per cent.

(2) No definite objectives of meetings; 68.4 per cent.

(3) Meetings too long; 55.0 per cent.

On the basis of the data collected, it is suggested that teachers be given more voice in planning the whole teachers' meeting program; that programs for teachers' meetings be carefully planned at the beginning of the school year; and that very few matters of a routine nature be brought into educational teachers' meetings.

THE EFFECTS OF EXEMPTIONS FROM SEMESTER EXAMINATIONS ON THE DISTRIBUTION OF SCHOOL MARKS IN THE HAMILTON, OHIO, HIGH SCHOOL

Clyde Wayland White, B.A.,
The Ohio State University, 1910

Department of School Administration

The problem of the study is: What are the effects of exemptions from semester examinations on the distribution of high-school marks?

By this study it is presupposed that the high-school teachers' interests and wholesome attitudes in respect to any policy affecting the welfare of their pupils are conditioned by correct information.

Constantly increasing demands require that the high-school administrators eliminate the procedures that are harmful and adopt those which are beneficial to secondary education. It is their responsibility to keep informed on these points.

This study makes inquiry to ascertain whether exemptions from semester examinations have had harmful or beneficial effects upon the distribution of marks in the Hamilton High School, and to determine to what extent one may outweigh the other.

Among high-school administrators, there is no unanimity of opinion as to just what have been the effects of the exemption system. There have been but a few incomplete and inconclusive investigations made, and no facts or figures submitted which permit a definite conclusion to be formed.

Hamilton High School, with an average enrollment of 1208 pupils and a large staff of teachers for the eight years of the study, has a wide range of subjects which makes possible a fairly complete study of the effects of the exemption system upon the distribution of school marks.

The study has revealed that the general distribution of marks in this school has been changed very little under the

exemption system. The medians show an average increase of 0.04 per cent, which is negligible. The lower quartiles have an average decrease of 0.19 per cent. The upper quartiles have an average increase of 2.33 per cent which is due to exemptions from semester examinations.

The average increase in marks above the exemption point of 85 per cent under the exemption system is 8.9 per cent, which is an average of about three pupils per class. This increase is not excessive. The study further reveals that practically all of this increase comes from the class interval immediately below the exemption point.

The only part of the general curves of distribution which is affected by the exemptions system is that near the point of exemption.

Four groups of subjects, English, mathematics, social science, and commercial, show an average increase of marks above the exemption point below the average increase of the school. Four groups, foreign language, science, vocational, and the miscellaneous group, show an average increase below the general average of the school. In only two groups, foreign language and miscellaneous subjects, is the increase excessive. Administrative attention is the solution here.

The results of standard tests given in this school show that the school compares favorably with national norms in the subjects tested.

The average high school of any size has a few teachers who are prone to be considerably less rigorous in their standards of marking than the average of the group. Naturally such teachers are less rigorous in giving exemptions. The solution, in such cases, is the responsibility of the principal whose duty it is to give remedial supervision.

On the whole, the exemption system in this school has not played havoc with the distribution of marks. On the contrary, the standards of the pre-exemption period of the study have been maintained.

THE NEGRO IN AMERICAN LITERATURE

Constance Helen Whiteside, A.B.,
The University of Cincinnati, 1930

Department of English

It has been only within recent years, at least the past twenty or so, that the Negro has had admittance to the field of literature—on his own. He has often been the subject for daring novels or treatises on southern plantation life—before and after the Civil War, but it was for the men like Paul Lawrence Dunbar, DuBois, J. W. Johnson, Chestnutt, and a few others of the group to gain recognition as writers in their own field.

In the body of the thesis I have traced, rather lightly because of the lack of material, the Negro's historical background in literature. He has gone through the years, accounting for several early writers and societies of research, with mention of various of the pioneers, thence through the folk lore to the present-day writers. The folk lore, which is so essential to the beginnings of literature of any race, I compared with the popular adaptations of Joel Chandler Harris, pointing out the differences between them and the true folk stories. Then came the first Negro writers of fiction, drama, and poetry, the pioneers who made the trail less difficult for the present-day followers. This brought the recent writers into the light, the younger Negroes who are slowly but surely gaining a foothold as authors of real worth. In this brief survey I neglected to mention several of the white authors but I have placed them in the bibliography. Julia Peterkin author of *Green Thursday*, *Black April*, and *Scarlet Sister Mary*, Connelly who has presented New York with *Green Pastures*, and Du Bose Heyward, author of the age-old classic *Porgy* are among the best known of these writers.

In spite of the newness of the Negro in the field of literature, I found everything I read to be completely fascinating.

Here is a touch that no white author can hope to acquire; it comes from the inmost depths of the Negro himself, a man who has been suppressed all his historical life and who has finally discovered a means of escape. To me the most interesting fact is that the Negro in literature is gaining such recognition as he may not gain in the outside world—that he is human beneath his black skin.

THE PROGRESS OF THE TECHNICAL AND ARTISTIC SIDES
OF ENGLISH MYSTERY FICTION

Frank Joseph Wiess, B.Sc. in Edu.,
The Ohio State University, 1929

Department of English

Because people (writers and readers) are individually and developmentally different, there happens to be good and bad mystery fiction. Our task is to select the good.

The literature of mystery has that dramatic, human element which catches and holds interest by a direct challenge. It is our delight to go searching for secret things, questing among secret places. The mystery tale has the strong recommendation of completely removing the reader from the daily round. Its chief effort is to interest, to be interesting in a degree never yet known; but to interest at any price.

The Gothic romance, coming as the first crude effort to surprise and excite, went to extremes, as must all perfervid reactions. It renounced the saner methods of romanticism and favored an unconditional surrender to appalling, nerve-shaking effects. Because it entirely satisfied the taste of the general public, the literature of Gothic Romanticism swept onward, until it became a turbulent river running wild over its banks.

During the interval of almost two hundred years since the first of the *shudder* romances, the stream has been con-

trolled, dammed up. Its murky waters have been purified and treated to suit the taste of a more critical public. And this is the fine achievement of those careful artisans of literature who turned to the writing of detective and ghost stories. Even on certain recent writers of mystery fiction we may bestow praise for the ascension of their work into the heaven of art and beauty.

It may therefore be worthwhile to examine at least the English literature of mystery and to note improvements in its content, manner, and technique. In this commentary the writer takes no sides, believing there are none. Likewise he makes no defence or apology for the existence of mystery fiction. Between rank and rut a line will be drawn and distinctions made by using in this study the products of those writers whose literary worth is attested. Mystery fiction as a long-recorded force and effort with which we must reckon, is the central point of the writing.

When an author in good repute accepts the challenge to construct and solve his own mystery, he does so because in him there is the desire, mayhap at purgatory heat, to put into a special, untried pattern some ephemeral or complex bit of imagery. The world may take for granted his wizardry of word and phrase; for this once he must "deliver" some other goods.

Compare this approach to that of the writer with an eye to what shall boil in his pot. His every word and thought, like Little Tom Tucker, go asking for supper; and he is assured of it because he writes for those who are willing to contribute to his board. The artist, however, cannot think of blazingly sensational content, for that would consume design, individuality, freshness—all in fact that would tend to preserve his projected story a thing of beauty.

There is no exact dating and placing of the first mystery tale. Yet there are to be distinguished in English literature definite beginnings of a tide of mystery fiction that has not ebbed as yet. We may begin at the point where mystery fiction in the accepted sense had its violent first impulses.

England was saved from literary dandyism in the middle

of the eighteenth century when Romanticism, with its predilection for lively colors and contrasts stood forth for the unhampered word and thought. It was a specific objection to a colorless classicism. Once fully unleashed, it became giddy with the freedom from restraint. The reaction became almost vindictive when it strode forth egregiously in the form of Gothic Romanticism. It took huge delight in the fact that it found new ways in which to please a reading public, namely: through the sources of mystery, wonder, fear, awe, and horror which had been overlooked or eschewed by classicism. Literature had gone from an effort to moralize to an effort to entertain.

When the public was surfeited with Gothic horrors, the time for avoiding the impossible and unexplained was at hand. Walter Scott was most alert to changing public taste and desire; he set mystery in romance and romance in mystery. In place of the horrible din, the black character, the satanic scheme, the appalling maze, and the pell-mell accumulation of incidents without causal explanation, Scott projected mystery by delicate hints and gave it silent and smooth outcomes. In Scott, mystery is either balanced precariously with romance or rendered subordinate to it.

The horror story is a plausible turn in the path of development of the detective mystery. The overroused sensations of awe and terror might conceivably yield to a superinduced wish to have awe and terror stopped at their source and for good. If the mystery story in general evokes such a wish, the detective story feeds it fat for the express purpose of *fulfilling* it.

Poe's feat consisted in being the first writer to catch and maintain attention in a story the interest of which lay solely in the effort to follow human intelligence as applied to solve a problem. He tapped *all* the wells of mystery, even unto mysticism; but his most prominent contribution to mystery fiction was, of course, the detective story. It is his stand on analysis and intuition that does most justice to the question of deduction as story material. The experiment to investigate the possibilities of intellectual suspense proved an immense success. It threw open a field that has ever since been

ploughed and tilled with apparently undiminishing, though at times "poor quality" yield.

Moreover, the stories of Poe mark him as the final master of Gothic and ultra-Gothic elements of romance. Instead of producing promiscuous fears, he induced *a* fear by describing its reaction in the senses and thoughts; instead of piling up horrors, he dilated upon the effects of *a* horror.

The plane of the story sensational was raised to a highly artistic one by Wilkie Collins. This result was attested in his being the first warmly received writer who concocted mysterious mischief for novel-length story. He used mystery as a strong support for the heavy superstructure of romantic fancy. The statement that he worked according to formula cannot cover the case of *The Woman in White* which remains nothing short of a marvel of romantic narrative, threaded, saturated with mystery. It presents a mystery not only in the form of a chain of problems to be solved, but also through an undercurrent of semi-supernatural implications. The device of narration is unique; all characters involved state first-hand their parts in the drama of crime by diary, letters, or legal confessions.

Conan Doyle, because of his multiplying Sherlock Holmes stories, could make various attempts to strengthen the weak spots in detective mystery fiction. Specific, pointed characterization; new modes of suspense and retardation; variety of problems and their surprising solutions; judicious use of coincidence and of keen, inclusive inferences—such were the major contributions of Doyle.

Chesterton is the first writer to manipulate mystery to a purpose. He twists the reasonings of Father Brown into gentle taunts for such as are prone to believe that superstition and ignorance are bred in religion. The whole burden of the volume aptly called *The Incredulity of Father Brown* is a smashing derision of this notion. Yet so closely woven are purpose and story that we accept both with reserved admiration. As a detective Father Brown is extremely hard to follow, for his thoughts leap and settle—in silence. No

detective in fiction, however, is more consistently, humanly, sympathetically portrayed.

While dealing in the mystery of crimes and their occurrence, Chesterton does not give the impression that his interest is primarily in solution. Rather it is in clearing up the obfuscation, the haze of atmosphere and environment which makes the crime possible. Each story drives toward the "moment charged with a surprise." And when the modest clergyman's feats are done we marvel at Chesterton's reticence on his hero's mental acumen. To Wilkie Collins we attribute the sensational perplexity; to Doyle the uniqueness of problems and variety of solutions; to Chesterton the rapidity of psychological analysis and motive-reading; but to Poe—cold, undeniable logic.

In recent fiction the detective is keeping pace with science, invention, and education. He has a more critical audience for his performances than had his forerunners, simply because mystery fiction constantly increases and tends to be its own severest judge. Notable is the effort of modern mystery novelists to challenge the long-standing triumph of the short story.

The genesis of the *ghost* idea in literature is lost in tradition. As regards the ghost story, the discussion considers probable influences, sources, and beginnings. Leading writers, favorite devices, and lasting examples are taken up in support of the belief that the ghost story provides a medium for a high art. A philosophy, critique, and evaluation of the ghost story, and of mystery fiction in general, concludes the study.

When all is said (indeed, despite it!) countless readers rejoice in the one important and welcome fact that prominent authors have written and are writing mystery fiction worthy of a place in literature. Improved artistically and technically, it is, I believe, answering the purpose not just of amusing thousands, but also of bringing them to appreciate other forms of imaginative writing. We have outgrown the mental infancy of Diamond Dick days. We are finding, too, that nothing is so thoroughly democratic as literature.

THE APPLICATION OF THE MOVING TRIHEDRAL TO CERTAIN CURVES

Miriam Lucille Wolgamott, B.S.,
The College of Wooster, 1925

Department of Mathematics

An examination of the properties of a second curve which shall have one of the nine possible relationships of its tangent, principal normal and binormal to the tangent, principal normal and binormal of a given curve. By making use of the moving trihedral we determine the relation of the direction-cosines at corresponding points on the curves with respect to a fixed direction in space.

There is a solution when:

1. The principal normals of the given curve are principal normals of another curve. Such curves are called Bertrand curves.

2. The principal normals of the given curve are tangents to another curve. If the second radius of curvature is infinite the curve is plane, and the second curve is the evolute of the given curve.

3. The principal normals of the given curve are binormals to another curve. There is a solution here if

$$K\left(\frac{1}{\rho^2} + \frac{1}{\tau^2}\right) = \frac{1}{\rho} \quad K \text{ being constant.}$$

4. The binormals of a given curve are binormals of another curve. It is necessary that the curves be congruent and lie in coincident or parallel planes.

5. The binormals of a given curve are the principal normals of another curve. There is a solution here only if we admit the case when the curves degenerate to two parallel straight lines.

6. The tangents of a given curve are the tangents of another curve. This condition is fulfilled only when we admit the very special case that both curves degenerate to the same straight line. There is no solution when: (1) the

binormals of the given curve are the tangents of another curve; (2) the tangents of the given curve are the principal normals of another curve; and (3) the tangents of a given curve are the binormals of another curve.

THE MARKETING OF HOUSEHOLD POTTERY IN OHIO

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Otterbein College, 1925

Department of Economics

The manufacture and sale of pottery is one of the oldest industries known to man. In America, the pottery industry was one of the first industries established. The first pottery, as far as can be learned, was established in Burlington, N. J. in 1684 by Dr. John Coxe. Since 1684 the industry has steadily grown so that in 1923 the value of pottery, terra cotta, and fire clay products manufactured in the United States amounted to \$447,808,000. In 1925 the amount had decreased to \$444,808,000. Of the pottery producing states, Ohio ranks first with an output valued at \$97,463,000. Pennsylvania is second with a product valued at \$67,338,000.

The early potteries in this country were small plants consisting of a small building and a kiln made of stone, logs, and mud. The line of ware manufactured consisted chiefly of milk pans, jars, jugs and fruit cans. The potter could market his ware through a number of channels that were prevalent at the time. The important outlets were through sale directly to consumers from the wagons, the general store located in small towns and at crossroads, the local storekeeper, local buyers, and river boat merchants.

When the steam plant came into existence the small potteries were put out of business. The increased volume of the new plants brought about a change in the marketing

system. The new system brought the jobbers and wholesalers into prominence. This manufacturer, jobber, retailer channel was prominent until ten or fifteen years ago when the manufacturers began to sell their products directly to the retailers. This shift of the marketing channel has been due to changed conditions in the market. The chief factors contributing to this change are as follows: the development of large scale retailing, increased competition for the market, conflict; between the manufacturer and jobber, and finally dissatisfaction on the part of manufacturers with the service of the jobber.

In the marketing of dinner ware especially, the jobber is gradually being eliminated. In the stone ware business, jobbers are still of importance, especially where there is a financial tie-up between the manufacturer and jobber. Art ware is marketed almost exclusively through the manufacturer, retailer channel of distribution. Hotel and baking china are still marketed very largely through the use of jobbers or wholesalers. However, there is at present a tendency to go direct to retailers and consumers.

The industry is progressive in respect to manufacturing procedure and marketing channels. In regard to originality of design and character, the industry is not so progressive as many of its foreign competitors. This is especially true in the dinner ware business. In art ware this criticism does not hold as in other branches of the industry. In the stone ware business there is a need for research in order to determine new uses for the ware, and to create a desire for the product. It seems that there is a strong possibility of increasing the use of pottery through a vigorous coöperative advertising campaign on the part of manufacturers in the different branches of the industry.

STUDIES IN PHOTSENSITIZATION

Dorothy Jane Woodland, B.S.,
The College of Wooster, 1929

Department of Chemistry

It is known that mercury excited by radiation from a mercury arc can furnish sufficient energy in a collision of the second kind to cause chemical changes to take place. Important reactions studied are the hydrogenation of ethylene, the formation of water, and the decomposition of various organic compounds. Cadmium vapor excited by a cadmium arc has also been studied and suggestions as to the possibility of using zinc have been made. The present study was undertaken to determine whether excited rare gases might not also be effective. As the rare gases absorb only in the extreme ultra-violet, photosensitization in the ordinary sense is impossible; that is, the rare gases cannot be excited by absorbed radiation in regions convenient to work with. However, the rare gases can be excited by an electric discharge. Herein lies the whole problem.

The procedure was as follows. The gas under consideration was subjected to the action of an electric discharge and the amount of decomposition by increase in volume was noted. An approximately equal amount of rare gas was then mixed with the gas studied in the next run, subjected to the discharge, and the amount of decomposition compared with that previously found. The gases used were ethylene, silicon tetra-methyl, and natural gas which is 85-90 per cent methane. The effect of both helium and argon was investigated. In all cases negative results were obtained; that is, the presence of helium or argon did not increase the decomposition as had been expected. These may be explained as being caused by the very rapid decomposition resulting from the discharge alone. Had compounds more difficult to decompose been used, the rare gases might have been effective.

THE ADMINISTRATION OF THE SYRIAN MANDATE

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The Ohio State University, 1926

Department of History

In *The Administration of the Syrian Mandate* an effort is made to show the results of the mandate system as applied to Syria by the French. The facts involved, as well as the critical comment on the policies of the French administration, are based largely on the records of the Permanent Mandates Commission, whose job is to hear the report of the mandatory, annually, and then advise the Council as to the successes or failures of the mandated Power.

The study shows that France's present position in Syria is not a comfortable one. Many difficulties remain for future solution. The political situation seems to be the most pressing, for the granting of the demands of the Nationalists would be a denunciation of the mandates system as applied to Syria. Thus, the problem becomes one of world concern, since the political status of Syria was determined by the nations of the world in the territorial readjustment following the war.

As for France's record during the ten years in Syria, there have been successes and failures. Certainly, the rebellion of 1925 and 1926 will remain as a blot not only upon the French administrators and advisers but also upon the Permanent Mandates Commission which failed to discover the existence of revolt-provoking conditions prior to the actual outbreak. On the other hand, much credit is due the mandatory for the inclusive industrial, financial, and social reforms which have gotten under way during this decade and which will be the determining factors in establishing a people "able to stand by themselves under the strenuous conditions of the modern world."

At present, several changes are deemed necessary for an improvement of the mandates system in Syria. The Com-

mission must be supplied with more complete and authentic reports from the natives, and then must possess the power and initiative to recommend such steps as will secure improvements. France must use only qualified men in the various positions and then give evidence to the world that the mandates system is being applied in its fullest conception.

